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WITH

INTERNATIONAL ABSTRACT

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THE TREATMENT OF SINUS INFECTIONS BY PHYSICAL AGENTS*

FRANK THOMAS WOODBURY, B. A., M. D.
Lieut. Col., U. S. Army, Retired.
NEW YORK CITY

With the proviso that sinus infections are not only the cause but often the result of pathological processes, either acute or chronic, elsewhere in the body, it is essential that we should go through the following steps as thoroughly as may be permissable in any case having symptoms referable to the sinuses:

1. History taking, including the report of the referring physician.

2. General physical examination, including nose, throat, and ears.

3. Transillumination of sinuses.

4. X ray studies, preferably stereoscopic, where the indications warrant the expense.

5. Radiothermic applications for diagnostic reasons.

In reference to the history taking: The report sent by the referring physician may concern itself with symptoms not referable to the sinuses. A general physical examination will disclose such condition. Where the case is referred because of sinus symptoms other conditions are discoverable only by a general physical examination. Any x radiographs or laboratory reports will save in many instances further expense.

The physical examination should be complete. It is not sufficient to verify the statements in the report made by the referring physician, but all possible complications, whether etiologically important or not, must be noted.

Such conditions as asthma, hay fever, obscure coughs, catching cold easily, facial neuralgia and oedema, toothache (canine especially) rhinorhoea, headache, transient occlusion of one or other naris, tenderness on pressure, duskiness of the skin, are local evidences of sinus trouble which with an unpleasant nasal discharge, with an odor highly abhorrent to the patient, but not to his friends, implicate one or more sinuses.

One must be on his guard for sinus infection following the acute exanthemata and other nasal and pharyngeal infections such as measles, diphtheria, whooping cough, etc., and suspect it where there is a recrudescence of fever with chills. Again sudden attacks resembling malaria, typhoid or septicemia may have their origin in an acute sinusitis. Poor health, delayed convalescence, under-weight and lack of appetite,

*Read at Sixth Annual Meeting, American College of Physical Therapy, Chicago, Nov. 3, 1927.

apathy, lassitude, somnolence, loss of memory, neurasthenia, melancholia and irritability have all resulted from sinus infections, especially the chronic types. Arthritis, neuralgia and neuritis, lumbago and muscular cramps have been ascribed to the same source.

In addition to nasal and pharyngeal conditions, quite a variety of ocular diseases and conjunctival inflammation, otitis media, earache and tinnitus, sinus thrombosis with meningitis and attending general symptoms such as projectile vomiting, bradycardia, Cheyne-Stokes respiration, etc., are attributable to extension from the sinuses.

In making the nasal examination we may find polypi, hypertrophies and deflections, synechiae and occlusions. We may find a discharge and its source which may be determined by first syringing out the nostrils and employing suction or causing the patient to blow the nose, then placing the head first on one side, then the other, then low forward and inspecting for possible flow after each posture.

If a good lamp is used all the sinuses except the ethmoid and sphenoid can be transilluminated as well as the mastoid. Certain fallacies may occur with its use, however. The opacity may be due to a solid growth as a polypoid mass or sarcoma. The sinus may be absent, rudimentary or asymmetrical. The inflammation may not be purulent, in which case there is no opacity. If there be pus it may have evacuated just prior to the examination.

X ray evidence is quite valuable, especially stereoscopic films, to reveal anatomical anomalies, the origin and extent of purulent processes, the degree of bone destruction, the presence of new growths and in particular to disclose ethmoidal and sphenoidal conditions not otherwise demonstrable.

Having removed obstructions such as synechiae, deflections, and polyps by surgical procedures and treated lymphoid hypertrophy by x ray, an application of radiothermy from a carbon filament lamp or diathermy from a high frequency circuit will often produce a profuse, thick green discharge from the infected sinus with concomitant relief, thus obviating the necessity of surgical procedure.

The treatment consists of a tonic irradiation from a 20 to 25 ampere arc lamp, using plain carbon electrodes for twenty minutes each to back and front of the nude body. This is followed by diathermy through the sinuses where the deep ones are involved, while radiothermy may be employed for the antra and frontals. The treatment electrodes may be of equal area when the current passes across the face or from face to nape of neck. When one sinus is being treated a large indifferent electrode may be employed on the back. Autocondensation will work as well as the so-called d'Arsonval current, in which case condenser electrodes of glass may be used in the nostrils. These electrodes may be also employed with the Oudin current, using a foot switch which the patient may manipulate himself. The treatments number at least 20 and may be of forty-five minutes' duration.

The best electrode material for facial contours, I find, is ordinary florists' lead foil which will readily adapt itself to surfaces.

These treatments are repeated every other day in the chronic and subacute cases alternated with very mild doses of x radiation. Where there is much turgesence positive electrolysis is indicated, five to ten milliamperes for fifteen to twenty minutes. Repeated if necessary.

In the acute cases an additional application of radiothermy usually from a 265 watt carbon filament lamp for a period of 40 minutes, as closely as can be borne by the skin, will promptly abort the inflammation and if used in the acute nasal infections will prevent extension to the sinuses. This is especially important

in measles, diphtheria, whooping cough and influenza.

Diathermy and x ray are preferable when the inflammation is deep seated in ethmoid and sphenoid sinuses.

In all cases where drainage is established and there is oedema or neuralgia the use of the interrupted condensation from the static condenser, which is called the "Morton wave," will reduce the oedema and relieve the neuralgia because of its shrinking effect upon turgid tissues. The same may be said for the static effluve.

Conductive heat or cold is inefficient since the energy is absorbed by the skin capillaries and nerves and while sometimes soothing it is never curative because non-penetrating.

Convective heat from hot air baths is not of value commensurate with the trouble and dangers from burns and fire.

Surgical entry into a sinus is admissable only when there is a solid mass which must be removed by morcellation. When drainage is thus obtained the physical measures mentioned are preferable to irrigations as being more efficacious and less annoying.

How long should we treat a sinus? The answer is, until all symptoms and signs cease. This sometimes covers a period which to the over-solicitous patient seems too long and an evidence of the failure of physical means, while on the other hand the results may follow so promptly after a few treatments as to be remarkable.

CASE REPORTS

The following case reports have been reduced to their minimum expression consistent with value. They have all been referred by other physicians:

Case 1. Dr. I. Suffered from pansinusitis following the flu in 1918. Condition was confirmed by x ray and operation was advised as the only resort by staff at Johns Hopkins. The patient was seen first in October, 1922, when a thick yellowish discharge from both nares seemed to fill the superior and middle passages. He suffered an almost constant headache and a very foul odor continually annoyed him. Nasal breathing was difficult and sleep was interrupted.

As he lived in a distant city radiothermy from a 265-watt carbon filament lamp was prescribed for his hours of relaxation and sleep, together with daily doses of diathermy. He reported but little change for a week then the maxillary antra began to clear up with reduced discharge and lessened odor.

By November there was marked improvement subjectively and objectively. The condition continued in diminuendo until spring when small doses of x ray were prescribed as an additional treatment.

In the fall of 1923 Dr. I reported that all subjective signs were gone and x ray skiagrams were negative, he having kept up the treatment at intervals, in the meantime.

Case 2. Mr. S. S. Age 59, but very vigorous and athletic. Complained of a tickling cough with a great deal of yellowish sputum, especially in the mornings, and a variable husky voice which at times was very annoying. He also had a dropping in the back of his throat with proneness to take cold easily. The symptoms dated back over a year when he had had an attack of flu. He had been using cough syrups and nasal sprays and gargles, but without relief.

Examination showed infection of the ethmoid and a septal perforation well healed due to correction of septal deflection surgically twenty years ago. The nares were clear and there were no laryngeal or pharyngeal signs beyond a very mild redness. The chest, especially over the bronchi, was clear. No other notes were made at that time. The physician reports use of vaccines, sprays, etc.

The treatment began in October, 1926. The enclosed carbon arc lamp ("Efka Heliol") was employed for general body irradiation for thirty-minute intervals, front and back, followed by electrostatic effluve to face and chest from a ten-disc Holtz static (condenser) machine and repeated every other day for three treatments. This gave considerable subjective improvement to the patient. Diathermy was then substituted. for the effluve, applying the treatment electrode to root of nose and the indifferent electrode to the spine. Five of these treatments produced abatement of all symptoms except the sore feeling in the larynx and the morning expectoration.

By November 30th patient reports no productive expectoration for first time in one year. The dropping in the throat is still present in slight amount. Small electronizing x ray treatments had been given, using a gas-filled tube (from the static current) for thirty-minute exposures at 20 inches, in addition to the diathermy and systemic artificial heliotherapy.

Treatments were reduced to twice a week, then once a week. For the last three treatments in February the Oudin current and vacuum nasal electrode were employed for twenty minutes to each nostril. Patient well since then. During January the patient experienced an acute attack of coryza with exacerbation of symptoms which subsided under the use of radiothermy applied at home from a 265-watt carbon filament lamp.

Case 3. Mrs. V. B., a professional singer, suffered from her usual hay fever attack during the summer of 1925, which ran into a frontal suppurative sinusitis, prolonging the hay fever symptoms. She came to me in early September, unable to sing a note and suffering from all the usual symptoms plus a frontal headache. Treatment at once of radiation from an enclosed carbon arc lamp to chest and reinforced by a 265-watt carbon filament lamp, radiating the face for forty minutes, followed by electrostatic effluve to face and throat for fifteen minutes. This relieved some of the headache and hayfever symptoms and she was able to sing a scale though not clearly. After leaving the office and during the night a great quantity of greenish mucous was discharged from the nose, giving a considerable relief.

Two more treatments on successive days cleared up the trouble sufficiently for her to have an audition whereby she obtained a contract to sing during the winter season.

I advised her to come to me at the beginning of the hayfever season the following year to attempt aborting or averting another attack. She had no attack the following summer nor this past summer although she has taken no treatment of any kind.

Case No. 4. Mrs. J. F. has suffered for several years from frontal headaches and rhinorrhea. Examination shows ethmoid and frontal sinusitis, also a chronic constipation of habit origin aggravated by taking laxative.

The patient was first seen by me in December, 1926. Diathermy was administered for thirty minutes through ethmoid and frontal sinuses followed by the electrostatic effluve to the face for ten minutes; this was alternated with general body irradiations from an enclosed carbon arc and the employment of rhythmic static induced current by means of abdominal and rectal electrodes each twenty minutes. Treatments tri-weekly.

The nasal and sinus infections cleared up by January and the patient experienced the first normal bowel movement in February. Treatments to the abdomen were continued at longer intervals until April. Since then she has enjoyed satisfactory health.

Case No. 5. E. F., aged five years, has been kept out of school because she had not convalesced satisfactorily following at attack of varicella. The child was fragile, under weight, irritable and troubled with poor appetite and

mouth breathing which was due to an ever-present accumulation of nasal secretion coming from the ethmoid which had been regarded as a very aggravated type of cold.

The patient was first given general irradiation from enclosed carbon arc plus radiothermy from 265-carbon filament to face tri-weekly. This produced a profuse discharge of greenish mucus from the nose after the first treatment and much subjective relief. Treatments were given tri-weekly for about one month when diathermy was substituted for the radiothermy and bi-weekly treatments. Altogether twenty-two treatments were given between December 27 and March 24, at which time all symptoms of illness had disappeared, the child had put on weight and begun to grow perceptibly and was re-entered in school. At intervals during the treatment the Oudin current was employed through a vacuum condenser nasal electrode for ten minutes in each nostril. This was done by the patient herself, using a foot swtch.

Case No. 6. Miss L. G., aged 22, has lived most of her life at Key West, where she has suffered for many years from a perennial hay fever with remissions never longer than a week at a time. At present she has been north for treatment and change of environment. She has been through the usual pollen antigen treatments several times without results. She was referred to me in May. An ethmoiditis was diagnosed and the patient was given general systemic irradiation from an enclosed carbon arc for thirty minutes front and back, from waist up, and ten minutes treatment in each nostril with non-vacuum electrode and Oudin current operated by a foot switch.

At the next visit, two days later, she announced that the sneezing fits were distinctly ameliorated. The treatment was repeated, adding the electrostatic effluve to face ten minutes.

Six days later reported but one sneezing attack lasting half an hour and no necessity for using a handkerchief. The previous treatment was repeated.

Three days later reported intermittent morning sneezing one half hour subsequent to arising several mornings, but other times feels remarkably well and happy. The treatment was repeated and in addition the Oudin current was applied to the spine by non-vacuum condenser electrode 15 minutes for its effect upon the sympathetic nervous system. The patient then went away for fifteen days to a farm in New York state. This was during the middle of June. During this time she worked in a garden patch, helped in the haying and lived a rural life, all without a symptom of hayfever.

On the 15th of June she had her final treatment and on the 28th returned to Key West, having had no return of the hay fever. Later advices report complete freedom from all symptoms.

Case No. 7. Mr. G. S. E. has suffered from a "dropping in the throat" for a number of years. Also a very aggravating dull ache in the nape of the neck. He has had hypertrophied turbinates removed and the usual nasal irrigations. He also suffers from attacks of urticaria. The x ray skiagraphs show some slight granulation tissue in the antra and hypertrophy of the superior turbinates with excessive secretion from the turbinal mucous membrane. The patient has been under treatment for over three months with but little or no effect upon the secretion except that it seems to intermit in flow. Doses of intravenous calcium, of ephedrine and ultra violet have served to reduce the frequency and severity of the urticaria. The pains in the neck have also abated. In this case mild doses of x ray were added to the treatment and the static interrupted condensation ("static wave") was used over the painful area in the neck. It is not believed, however, that any permanent relief will be obtainable in this case.

Case No. 8. Mrs. S. H. S. came to me suffering from an acutely dull pain over the

right eyebrow with tenderness on pressure dating from a long ride two days before in very inclement weather in an open automobile. There was nothing but the history to prove a frontal sinus congestion so diathermy was applied for forty minutes with immediate relief. No other treatment was required.

853 Seventh Ave., New York City.

Use of Ultra Violet Rays Against Alopecia. L'Independanse Medicale, No. 12, April 16, 1927.

Ultra violet light is not as yet very commonly employed against baldness. Certainly it is not a question of causing hair to grow on a scalp in which all the hair follicles are gone. It is a question of treating patients with an excessive oily secretion who lose all their hair at once or little by little. There is always downy devitalized hair left which does not grow any more. It is in these very special cases that ultra violet rays act with a certainty, but the treatment to be efficacious, must consist of an exposure to the strongest rays. The erythema dose should be reached, and the patient should be placed with his scalp about 30 to 40 cm. under the lamp for about a quarter of an hour. The treatment should be repeated two times a week, for about a month, and then once a week for about another month. It is evident that a single period of treatment is insufficient to cure the disturbed secretion, and it is necessary that the treatment be renewed more or less frequently according to needs.

Diathermy or Galvanization? Dr. Josef Kowarschik, Wiener Klin. Wschr., No. 26, June 30, 1927.

The purpose of the article is to show that galvanization is not only a good and useful therapeutic method, but one of the most valuable methods phyical therapy possesses. Although an old method, its value has been underestimated and forgotten.

Galvanization is incomparably more valuable than diathermy in all forms of neuralgia and neuritis. If 30 to 40% failures are to be ascribed to diathermy, then this number is reduced with galvanism to 10 to 20% Galvanization can be employed in all stages of neuritis including the acute stage. Unfortunately, it is too little known that more harm than good can result from the employment of diathermy in acute, very painful cases. Ischias or arm neuralgia, for example, can be considerably changed to the worse by one or two applications of diathermy. Similar reactions with galvanization, have never been observed by the author.

Galvanization is successfully employed in paralyses. The irritability increasing effect on the motor nerves and muscle fibers has been demonstrated clinically and experimentally. Galvanization is indicated in chronic joint diseases. It is recommended in the arthritis deformans of single large joints, by such famous clinicians as Erb. This is a disease in which diathermy is also especially successful. Finally the author mentions another instance in which diathermy and galvanization compete, and this is in the diathermy of the skull, or more correctly, the brain. This treatment is often employed today, not only in cases of nervous headache and migraine, but also in the sense of hypophyseal diathermy in climacteric symptoms, as congestion, palpitation, etc. The author cannot recommend this treatment, having seen very few good results from it. Galvanization is preferable in all these cases. The value of diathermy is overestimated, whereas galvanization is a valuable, considerably understimated therapeutic method.

Carbon Arc and Flame Lamps in Medicine and Surgery, Herman Goodman, M. D., Am. J. R. and R. T., March, 1927.

The author discusses first the history of phototherapy. Its definition and physics are then reviewed.

Development of carbon arc light sources is next detailed.

The art of carbon arc and flame lamp making has advanced decidedly. In addition, the carbons used have been impregnated with various salts, or are cored to emit particular zones of the spectrum in excess. It is absolutely essential to the proper understanding of the later discussion to know the difference between a carbon crater arc, and a carbon flame arc. Finsen, and his followers used carbon crater lamps. The direct current was forced through large carbon electrodes, the upper positive pole being twice as large as the lower negative pole. A crater was formed in the positive carbon and it was the crater which was the source of illumination. In our modern lamps, the carbons are impregnated. The carbons may be of the same diameter for positive and negative. The lamps operate equally well on alternating or direct current. The light comes from the crater only to a small degree. The flame formed between the carbons from the gases given off is the important source of light for therapy.

THE INFLUENCE OF TEMPERATURE UPON THE BIOLOGIC ACTION OF X RAYS

A. DOGNON, M. D.
STRASSBURG, FRANCE

Despite the fact that the question which I propose to investigate in this article does not seem to fit into the essentially clinical bounds of this review, I believe, however, that it will be of interest to those practitioners to whom any general question is not devoid of interest. Moreover, as far as dermatology is concerned, ideas and practical conclusions may be drawn from the facts I here present. The fact that the radiosensibility of cutaneous surfaces can probably be modified by the temperature as other biological objects which I have studied, may have interesting applications. Finally the radiologist can use with profit living material by the method which I have employed for a very exact biological control of irradiation. Having at hand as a result of other investigations an exceptionally favorable object and a very exact method of determining the intensity of the lesions caused by x rays, I have applied them to a study of the "coefficient of temperature" of the action of these rays.

We know that an ordinary chemical reaction possesses a coefficient of temperature which is generally considerable, that is to say that the rapidity of this reaction increases rapidly with the temperature. For a monomolecular reaction this rapidity is doubled with an increase of 10° C. This is not the case with photochemical reactions the origin of which resides in an electronic phenomenon independent of the temperature. The variations of the rapidity of these reactions are very weak or entirely absent.

Nevertheless, there exist exceptions, mainly for certain photochemical biological reactions, such as the assimilation due to the action of chlorophyl. In this case it is an action of temperature, not upon an initial photochemical reaction, but upon chemical reactions which are the consequence.

The reactions caused by x ray in the tissues which result in their destruction are probably of the same kind as a photochemical reaction. One may ask, what is the effect of temperature upon these biological reactions and when this is known, as we shall see, we may obtain interesting conceptions of their mechanism. Let us first examine how relatively simple reactions such as the blackening of the photographic plate or the destruction of cholesterine in chloroform solution behaves under variations of temperature.

I do not insist upon the very simple methods we have employed in answering this question. One produces upon one and the same photographic plate two impressions at two different temperatures with an equal amount of rays, afterwards a series of irradiations with an increasing number of rays. One compares the darkening of the plate either with the naked eye or with a selenium cell. In this way one discovers that in going from 20° to 40° C. or from 40° to 60° C. the action of the rays is multiplied by 1.2. Moreover, the quantity of cholesterine destroyed by a given dose of x rays is about 6 per cent higher at 40° C. than at 16° C., that is to say, the coefficients of temperature are very weak and about on a par with those which one noticed in the reactions caused by light.

As we shall see, this is not the case in reactions taking place in biological media caused by x rays, but that on the contrary in this case the action of temperature is considerable and one may draw certain interesting conclusions in regard to the mechanism of the action of the rays.

THE METHOD

Since the method which I have employed presents points of interest in various directions I shall describe it in some detail.

The biological material which I used was the egg of *Ascaris megalocephala*, material which possesses among other properties a high degree of sensibility, making the estimation of the degree of the lesion very precise (up to nearly 2 or 3 per cent). Employed with a precise technique it furnishes an object of choice for all quantitative researches into the biological action of x rays.

The eggs are obtained by expression from the uterus of an *Ascaris*, which may be preserved with no difficulty for several days on ice. They are carefully mixed upon a glass slide with a drop of water, afterwards divided up for purposes of different experiments upon thin slides of glass or mica, each preparation being a few millimeters in diameter, as thick as an egg, and containing some hundreds of eggs. It is not necessary to keep the material moist, for the eggs bear desiccation of many hours, but it is essential that the separate lots destined to be compared should be most carefully kept in exactly the same circumstances in this respect.

If one subjects one of these preparations to x rays one notices two phenomena which are easily seen; a retardation of the first segmentation (which occurs after three hours at 37° C.) and after three days the non-development of a *certain number* of embryos. While in some of the eggs the embryos are seen under the microscope to be well formed and motile, others show manifest lesions and in yet others one sees only a formless cellular mass. The percentage of embryos showing manifest lesions is an extremely delicate test of the rays. A preparation of eggs not irradiated has rarely more than 2 or 3 per cent of abnormal embryos. Two preparations submitted to the action of the same number of x rays under the same conditions give within 2 or 3 per cent the same number of injured embryos. So far as I know there exists no other material showing the lesions so precisely or so readily. The accompanying photographs show the appearance of the preparations, and one sees that it is very easy to distinguish the injured embryos from those of normal aspect.

EXPERIMENTAL TECHNIQUE

The experiments were conducted in the following manner: Having made the six or seven preparations of eggs of *Ascaris*, all of the same origin, which is necessary in order to have the lots comparable, they are placed above the anticathode of an x ray tube in a copper cylinder with double walls between which there circulates a current of water so as to insure a perfectly constant temperature. The preparations are placed at different distances from the anticathode, the nearest being at about 7 cm., the farthest 14 cm. from it. At a distance still a little greater, another preparation is placed in a very small thermostat of 2x2 cm., on the side of which one

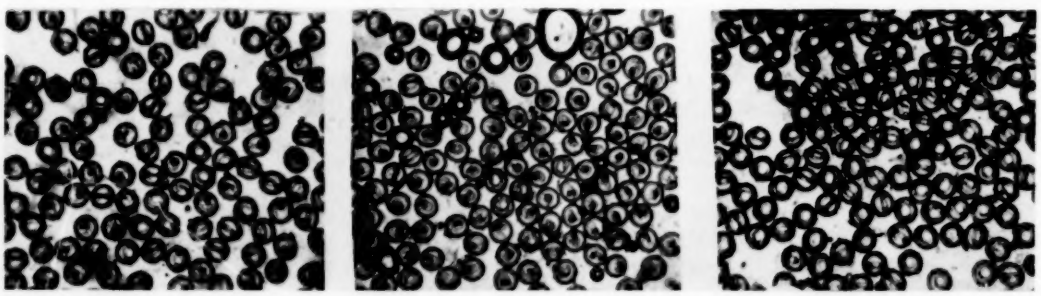

Fig. 1.—The lesions provoked by x rays upon eggs of Ascaris (eggs observed after 3 days of incubation at 37° C. 1 and 2.—Preparations having received different and increasing intensities of rays. 3.—Check preparation.

maintains a somewhat higher temperture by means of an electric current which can be regulated. The relative intensities of the irradiation received by the different preparations are known by their distance from the anticathode. The rays are produced by a tungsten anticathode under 86 K.V. and 4 M.A. (contact revolving usually without filtration or by an anticathode of molybdenum charged with 50 K.V. and 4 M.A. Under these conditions the duration of irritation is generally about ten minutes.

RESULTS

The four first preparations placed at the ordinary temperature at different distances serve to establish the curve of the lesion measured by the percentage of embryos injured in function by the intensity of the irradiation received. This is the curve shown in Figure 2. The general form always remains the same. The same intensity received by the heated preparation being known, one marks on the chart the points corresponding to that previously found, it shows that the sensibility has not changed. But one finds that this is always above the curve, that is, the action of the rays is always greater, and particularly so, when the temperature of irradiation is high. One notices on the graph that the point of the curve at which the lesions are equal to that of the preparation heated to 35° C., corresponds to an intensity of rays which is 2.6 times greater than that which has been effectively received by this preparation. We say therefore, that the coefficient of the action of x rays between the temperatures of the experiment is 2.6.

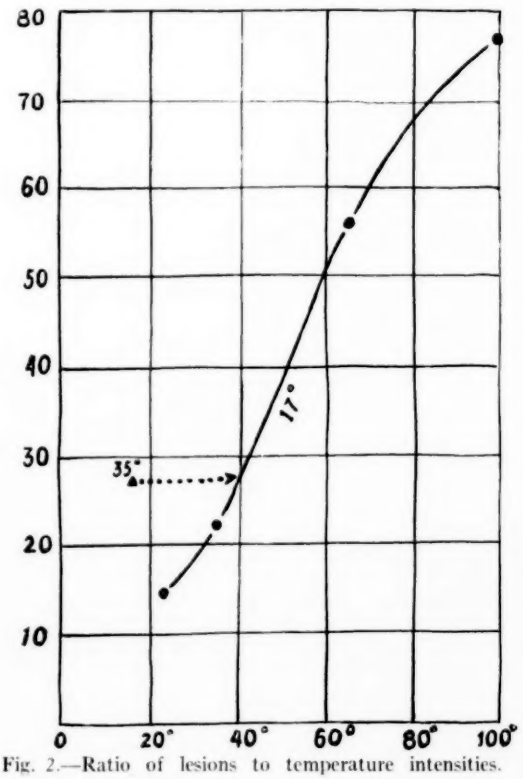

Fig. 2.—Ratio of lesions to temperature intensities.

In this table are given the values corresponding to this experiment: Anticathode tungsten. Filter 0.11 mm. thick; 86 K.V. 5 M.A. Duration twenty minutes.

Preparation No.	*Temperature*	*Relative Intensity Received*	*Number Embryos Injured Per Cent*
1	17°	1	77.4
2	17°	0.65	56.0
3	17°	0.37	22.1
4	17°	0.23	15.0
5	35°	0.16	27.3
6 check test	17°	0.0	1.

One sees then that the lesions presented by the heated preparation (No. 5) are more numerous than those in the preparation (No. 3) which received at 17° C. an intensity of irratiation 2.3 times greater.

All these experiments lead to analogous results, but differ slightly according to the length of the waves of the rays which were employed.

As is known, activity of the egg of Ascaris shows itself in the intensity of these changes, the rapidity of its development, etc., the rapidity being augmented with rise of temperature up to a maximum around 35° C., after this diminishing and becoming zero around 43° C.

One then may ask if the increase of sensibility to x rays when the temperature is raised is not connected with the increase of activity. We know that there exists often a relation between an activity of a tissue and its sensibility to x rays, the old law of Bergonie-Tribondeau, according to which tissues which are in the state of rapid reproduction are more radiosensitive. Joly, on the other hand, has shown that a lymphatic ganglion irradiated after a ligature on the afferent vessels in which the activity was diminished was much less sensitive than normal ganglia.

In order to know the relation which exists between the sensibility and activity in the case which I have studied, it was necessary to know how much sensibility filled in all the different accessible regions of the thermometric scale and in between to see if at a point above 35 where the activity commences to decrease, whether the same diminished or not.

In order to reply to this question, the experiment analogous to those which have gone before was performed in the following manner: Four preparations kept at ordinary temperature, were exposed to different intensities and to known amounts of radiation in a way that permitted of an establishment of a curve of the lesions in the function of the intensity, as in other preparations that received successively equal doses and doses which were known, measured on the ionometer at different temperatures.

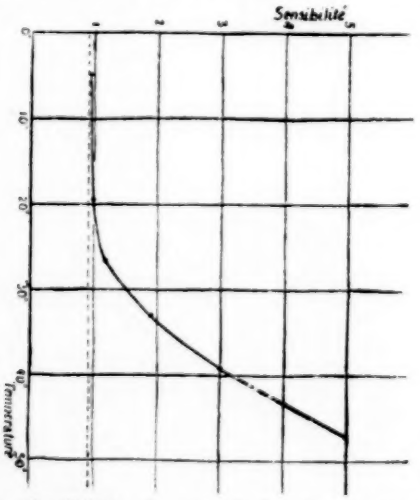

Fig. 3.—Sensibility of eggs of Ascaris to x rays in function of the temperature.

We here present an example of the titration, the result of an experiment corresponding to the curve of Figure 3.

Temperature	*% Embryos Injured*	*Relative Sensibility*
5 °	6.2	0.93
19.5°	6.6	1.
26.5	10.1	1.2
33.0°	14.3	1.9
39.0°	19.7	3.
47.0°	27.1	5.
Check test at 19°	1.	
Check test kept for 10 min. at 47°	1.	

One sees that at 47° C. the temperature changes are borne by the eggs for several minutes of the experiment, the sensibility continues to increase although the activity is extremely reduced if not entirely destroyed. It is therefore not contradictory to think of a direct relation between the biologic activity and the sensibility to x rays.

Moreover, one sees just at the point of 20° of temperature on the curve which has run up to this point almost perfectly horizontally. It now mounts very rapidly, the sensibility which has remained almost invariable between 5° and 20° now is augmented very rapidly. All of this takes place as if there existed two different factors in regard to sensibility. One of these factors is constant and its value is given by the sensibility to low temperatures, and does not vary with these low temperatures. It perhaps prevents the sensibility due to the initial photochemical action, which as we have seen, is due to the coefficient of the temperature and is very weak. The other factor varies very rapidly with the temperature and commences to manifest itself around 20° C. and becomes rapidly

preponderant. If one examines especially this arrangement of sensibility and leaves out of the question the sensibility as a whole, one notices that the coefficient of temperature is almost constant and remains in the neighborhood of four, a variation of 10° C. This is a coefficient frequently made with a chemical reaction. It suggests itself, therefore, that the weak arrangement of sensibility is due to a chemical reaction. But we do not know if this reaction is consecutive to a photochemical reaction or whether on the contrary it precedes the latter. In the latter case the matter might be represented schematically in the following manner: One may imagine that a normal reaction takes place in the cells transforming a body "A" insensible to x rays into a hypothetical body "B" which is destroyed by them. The rapidity of this reaction naturally increases with temperature. The quantity of the body "A" which is formed increases, and consequently the action of the x ray is also increased. All the causes which diminish the chemical reaction of the cells have then the effect of diminishing the sensibility. This, as a matter of fact, is what one observes, and it may be used to explain that the activity and the sensibility of the tissues vary generally in the same sense. When the optimum temperature is passed and since the activity diminishes as the temperature increases, this does not mean that the chemical reaction diminishes (the rapidity always increases) but that new processes either chemical or other come into play, which interfere with the continuation of life. One comprehends then that the sensibility continues to increase in proportion to the rapidity of the chemical reaction upon which it depends.

CONCLUSION

A certain number of interesting facts may be gathered from the experiments which have been enumerated. In the first place the sensibility to x rays varies greatly with the temperature. It is very probable that it is a general law which could be utilized in radiotherapy either for the augmentation of the sensibility of the local regions of the skin, in the treatment of psoriasis for example, or for the diminution of irradiation of a deep organ. The study of the method of variation of sensibility with the temperature permits us to analyze the factors of this sensibility and to recognize that which composes it at least in two of its elements, one which does not vary (photochemical reaction) and the other an ordinary chemical reaction which varies very rapidly with the temperature. It is very natural to assume that this chemical reaction precedes and permits the photochemical reactions with x ray in causing the formation of a body usually destroyed by them.

This method of analysis, imperfect as it is, may, as one can see, support the idea of a mechanism of action of x rays which is at the present time very difficult to define.

The Treatment of Erysipelas by Roentgen Ray, J. Edward Harbinson and John D. Lawson, Cal. and W. M., April, 1927.

The standard forms of treatment are reviewed. Roentgen therapy for erysipelas has received very little attention in American literature except for occasional reference in general articles. The reports of Hess (1918) and Schrader (1921) are alluded to. This present report is based on eleven patients treated with this form of therapy at the Woodland Clinic. The technique is described and the following conclusions made:

1. Roentgen therapy for erysipelas is a valuable form of treatment.

2. Relief is obtained generally within twenty-four hours.

3. The febrile period is shorter than in infections of equal severity treated by other measures and the usual length of illness is shortened.

4. There are, possibly, fewer complications and less chance of spread than in other forms of treatment.

5. There is no pain or discomfort attending the treatment.

6. Advanced, serious cases of erysipelas, involving fairly large areas, with high temperature and general infection may be treated successfully.

X RAY TREATMENT OF UTERINE HEMORRHAGE*

J. A. H. WEBB, M. D.
WICHITA, KANSAS

That uterine hemorrhage, either with or without fibroid complications can be successfully controlled by x ray is such an established fact that most writers on the subject during the past ten years migh be charged with plagarism in so far that nearly every one has begun his paper in almost identical words.

I shall divide uterine hemorrhage into three classes. First, prolonged or excessive hemorrhage from a uterus showing no gross pathology. This will include the cases of subinvolution and so called cases of chronic metritis.

Second, hemorrhage associated with fibroids and third, hemorrhage associated with carcinoma polyps, submucous fibroids and erosions. This third class will not be discussed as they are cases in which surgery is clearly indicated.

In discussing the first division it would first seem reasonable to review briefly the conditions or processes controlling or causing the menstrual flow.

Researches on clinical material and by direct experiment on animals have demonstrated beyond doubt that a substance exists in the corpus luteum and also in the placenta which introduced into the organism produces normal menstruation. In other words menstruation depends upon the graafian follicle in some stage of its development.

In 1908 Hitschimann and Adler in their studies of the so called chronic endometritis, viz. endometritis hyperplastica, endometritis villosa, endometritis polyposa, etc., as the primary cause of uterine hemorrhage demonstrated that this congested, edematous membrane is but an exaggerated form of the normal premenstrual endometrium. This has since been confirmed by the researches of many others.

It was once believed that the fibrosis in the muscles and vessels of the so called chronic metritis was the probable cause of hemorrhage occuring in women who have borne several children but as this condition of the uterus occurs as frequently in the multipara who menstruate normally it is now conceded that hemorrhage depends on a disturbance of the graafian follicle.

If we are then to believe that abnormal uterine hemorrhage is but a variation of the normal we can seek relief in the destruction of that element which is responsible for the menstrual cycle, namely the graafian follicle.

Fortunately certain cell structures of the body are much more susceptible to radiation than others. The ripe graafian follicle next to the lymphocyte and the spermatozoa is most susceptible to x ray and radium. The ripe follicle is much more sensitive than the young follicle.

Such being the case, it follows that a dose of x ray sufficient to destroy the ripe follicle will produce a period of amenorrhea and increasing the dose to the extent of destroying the primordial follicle will produce the menopause or a permanent amenorrhea.

There is considerable difference in the dose necessary to produce the menopause in different women but about 35% of an E. S. D. delivered to the ovaries of women above thirty will produce a permanent amenorrhea. In women between 25 and 30 this same dose produces permanent results in many cases, in others the menses return in twelve to twenty four months. I do not feel that it is even safe to say that

*Read at X Ray and Physical Therapy Meeting, Kansas City, August 29, 1927.

such a dosage will not produce permanent results because of the susceptiblity of different patients to radiation.

There is another class of cases which should be included in this classification. They are those upon whom operation has been performed in which the patient has already been made sterile either by removal of the tubes or hysterectomy and the cervix left, who have excessive flow. These patients can be given a full dose with every assurance of relief.

In discussing cases under the second classification, namely hemorrhage associated with fibroids, the treatment of the hemorrhage should be considered along with the question of the proper treatment of fibroids.

Long before the use of x ray therapy certain basic principles were considered in the treatment of fibroids. The presence of a fibroid itself was not a menace and caused no damage except by its size because it does not change from a benign tumor to a sarcoma and sarcoma are so rare that operating on suspicion harms more women than it benefits. Fibroids are operated because of hemorrhage or because of pressure on nerves or adjacent organs or because of rapid increase in size to a large tumor mass.

It has long been noted that many fibroids decrease in size or disappear entirely during or after the normal menopause has been established. That this reduction takes place more rapidly when amenorrhea has been induced by x ray is likewise well known among roentgenologists and their associates.

There is some difference of opinion as to the exact manner in which reduction is produced, some believing that there is a direct action of the rays on the tumor itself, others that the shrinkage is due to the amenorrhea produced. There is evidence to substantiate the claims of both but most observers feel that generally speaking best results are obtained when the menopause occurs.

In september, 1919, Dr. A. Beclere, Paris, France, read a report of 400 cases of uterine fibroids before the Congress of the Association of Gynecologists and Obstetricians at Brussels. The ages of the patients treated were from thirty to fifty-nine years. He says in 338 of these cases where the tumors were palpable accurate measurements were made as to the height of the tumor above the symphysis pubes before treatment to the following extent:

In 9 patients 25 to 30 cm.
In 25 patients 20 to 24 cm.
In 51 patients 15 to 19 cm.
In 111 patients 10 to 14 cm.
In 104 patients 5 to 9 cm.
In 38 patients 1 to 4 cm.

In closing his paper he said, "I think I have shown that radiotherapy has a direct action upon fibroids, arresting their development and producing a more or less complete regression; that it is as useful before 40 years as after; that it is just as efficacious on fibroids of great size as on those of small dimensions; also, that it is useful in cases with normal menses as well as is those with metorrhagia." And "Outside of certain pathological conditions which demand immediate surgical intervention, radiotherapy is applicable to all uterine fibroids."

In 1918 James A. Corscaden of the Department of Surgery, Columbia University, New York, in a paper on this subject answers the most frequent objection to the use of radiotherapy in these words.

"The most important objection to the use of radiotherapy is that a malignant is promiscuously used in such criticisms. It is true that a sarcoma may be overlooked, but it is agreed that the occurrence of sarcoma is very rare—less than one-half of one per cent—and that it may, except in the case of a rapidly growing tumor, be neglected in determining the proper treatment. Greater stress is laid on the coincidence of carcinoma or epithelioma with fibromyoma—about five percent of the fibroids. The claim is made

that the neglected cancer in radiotherapy goes on to its fatal termination, whereas the cancer discovered in the specimen after hysterectomy has been performed will have no harmful consequences.

"I cannot strongly enough repudiate this attitude. A malignant epithelial tumor of the uterus is readily accessible. No matter what the form of treatment outlined for the fibroid, it must be altered when the cancer is discovered. In this clinic an examination under the anesthetic with curettage precedes the further treatment, whether it be hysterectomy or radiotherapy. If the curettings are suspicious, a frozen section is made and the exact diagnosis established. In two cases in our series an unsuspected carcinoma has been disclosed, and the proper complete operation performed. I wish to repeat that a carcinoma discovered diagnostic procedure.

"The next objection is that the fibroid may "become malignant." Again, unfortunately, the word malignant is promiscuously used. Theortically a myoma may become a sarcoma, but evidence is very scant that such has occurred. That a fibromyoma could become carcinoma is of course not to be thought of. Whatever mesoblastic tumors may become hypoblastic, the uterine tumors are not amongst them. If the fibroid had a chronic irritative activity, there should be a greater incidence of carcinoma among fibroids, where, as a matter of fact, it is about the same as that given for women in general."

I have used this lengthy quotation from Corscaden because he has so thoroughly covered the ground.

Pfahler of Philadelphia has on several occasions made the same statement.

In November, 1920, J. E. Panneton, Montreal, Canada, in reporting a series of 44 cases says: Radiotherapy is indicated in the following cases:

1. In small, simple fibromata character ized only by a sensation of weight or fatigue in the lower abdomen, with menorrhagia.

2. In large fibromata, palpable through the abdominal wall, rising perhaps as high as the umbilicus, and accompanied by such symptoms as mechanical type of constipation, very difficult to overcome, due to pressure on the iliac colon; frequent micturition due to diminution, by pressure, of the capacity and sacral flexures. The menstrual periods may be normal as to the amount of flow and duration, or may be slightly increased in both.

3. In fibromata of any size accompanied by more or less severe hemorrhage.

4. In uterine hemorrhages of non-infectious origin, and in certain painful menorrhagias, without demonstrable fibroids.

5. In uterine hemorrhages with subinvolution, or in the hemorrhages preceding a delayed menopause.

In all of these cases, the results obtained are such as to be best represented by the words "cure," or "clinical cure," provided that the dose administered has been considerably more than that actually necessary to produce the menopause.

Perhaps the most frequent question asked by a patient and physicians regarding this treatment is concerning the effect of the radiotherapeutic menopause. I can answer this best by quoting the conclusions of James A. Corscaden in a study made on the subject and report in the American Journal of Obstetrics and Gynecology in June, 1926. The author's conclusions are as follows:

1. The only constant symptom of the radio therapeutic menopause is the so called "hot flash."

2. Associated with the hot flash there occasionally occur sensory disturbances, predom-

inant among which are numbness and tingling in the fingers and a sense of stiffness in the hands.

3. A few women over the age of forty appear to have increased blood pressure after the radiotherapeutic menopause, in each case explainable by kidney disease, mode of life, or emotional state. There were no cases in women under this age.

4. Changes in the age appearance, secondary sexual characteristics, and libido have not occurred.

5. Obesity has not occurred with any regularity. The basal metabolic rate has shown no change.

6. Psychic disturbances are rare. The cause seems to be similar to that of other psychoses and not directly attributable to the loss of ovarian secretion.

7. The management of symptoms and conditions following the radiotherapeutic menopause should be based upon general principles rather than upon the theory that they are caused by the loss of the ovarian secretion."

This question of size in fibroids is a hard matter to settle. However, you would be surprised at the size of fibroids that can be influenced. We have treated some 30 centimeters, but I think most men will agree with me when you have large fibroids it is better to have them removed surgically.

About five years ago a lady came into the office and asked this question: "Does x ray do fibroid tumors any good?" I said, "sometimes." She was rather a chunky individual. I said, "Have you a fibroid?" "Yes." I said, "How large?" She stood up and she looked as though she might be about six months pregnant. I told her it looked too large to me to be treated and that I thought probably the thing for her to do was to report back to her physician and that if he didn't do surgery himself he would refer her to a competent surgeon for the removal of the fibroid. She said, "I have heard that same thing before. I will not have it removed; if I have to die I will die with it inside of me. It is not a question of finances; I am amply able to pay for x ray or any other treatment, but I am not going to be operated on."

I gave her one series of treatments and produced the menopause. I told her to report back in five or six weeks and see what happened. I was anxious to know if there was reduction and when she came back I couldn't notice that I had influenced it in any way. She said she came back for another treatment. I said, "No, you are not going to get any more; I don't feel like treating you; I don't feel that it is going to do you any good." She went out very much displeased. That went on for eight or ten months. I didn't hear from her. In the meantime I had been treating other cases and thought I would like to find out what had happened, so I called her on the telephone. I said, "How are you?" and she said she had taken five inches out of her waist band. I asked her when she was operated on and she said she wasn't operated and if I wanted to see her she would be glad to see me. She came up in the course of a week or so. You couldn't tell she had had a fibroid from her general appearance. She said it was about four months from the time she began treatments until she began to reduce.

DISCUSSION

DR. QUANTIUS (McPherson, Kansas): I think this paper is most interesting; it is such a common condition that we meet, and I want to commend the doctor for taking a stand on malignancy with fibroid and upon the fear of fibroid degenerating into malignancy. We know that he has said that is practically not to be thought of.

I have had this experience. One fibroid treated perhaps five or six years ago, the patient didn't continue treatments until the fibroid had completely subsided and she came back perhaps three years ago. She responded beautifully to treatments. I started again and again she quit coming; recently she returned with the

largest fibroid I have ever seen and I have been unable to get any reaction to her treatments. It is the only case out of quite a number that I have had that I don't get results. I am wondering if she has built up an immunity against x ray? Anyway I can't get results.

DR. MORIAN (Denver): I see them occasionally in x ray work but six or seven years ago this month I was called to see a lady about 42. She had been hemorrhaging she told me about six months; she was decidedly anemic, blood pressure low, hemoglobin down to between 40 and 45, and also a moveable tumor. I thought there was a cystic condition of the ovary. I took her to the hospital, built her up as well as I could and decided to remove both tumors but when I got into the abdominal cavity I found that the uterus had become so large that it involved the entire cavity. It would have been dangerous to remove it, hemorrhage would have been so great, consequently we left it, and sent her to one of our very good x ray men in Denver. He gave her treatments for about two or three months, the tumor was all absorbed, he got very excellent results, and that proves that because we fail in one case we need not be afraid to try it in the next.

Recent Indications for Diathermy and Electrocoagulation. Prof. G. Nobl and Dr. O. Glassberg, Wiener Klin. Wschr., No. 7, February 17, 1927.

Many papers in recent French, German and English literature reflect the eminent service rendered by conservative diathermy in infectious granulation tumors of the skin, (lupus, syphilis), exudative inflammations of the exematous and artificial dermatitis type, circulatory disturbances and many other lesions of various causes.

Nobl and Glassberg are convinced of its value in acrodermatitis atrophicans. The inflammatory forms, with the wrinkled and edematous skin of a livid red color, react favorably to diathermy. The process is not only brought to a standstill, but there also ensues a firmer binding together of the atrophied tissue elements of collagenous and elastic nature. It was possible to observe, histologically and clinically, healing and growth of epithelium, papillae and cutis propria.

The value of the hyperemia and hyperlymphemia caused by the high frequency current is well established. With the aid of thyroid diathermy, the authors not only caused an improvement in a number of difficult sclerodermy cases but also succeeded in bringing about a change to almost a normal condition insofar as the relation of the skin to the underlying structures was concerned. The diathermy is applied diagonally to the thyroid, the current flowing through equally large electrodes for 25 to 30 minutes with an intensity of 0.5 to 0.7 amperes. Patients were diathermized on an average of 30 times, with weekly rests after every ten consecutive days.

There is a general agreement that diathermy checks pains and cramps. The authors convinced themselves of this valuable, and at the same time lasting effect of diathermy in the treatment of Roentgen keratomas and ulcerated Roentgen carcinomas. Currents of 0.3 to 0.5 amperes applied one-half hour removed the pain after several weeks treatment.

Whereas in conservative diathermy, the boundaries are limited in such a way that there results an optimum physiological effect without a lasting tissue injury, in electro-coagulation the aim is always destruction. Some time ago the authors published their success with hypertrichosis, which they were able to cure by means of a simultaneous massive destruction of the follicles by the high frequency current. It is possible to coagulate the papillae of 100 or more hairs in 10 to 12 minutes with a current intensity of two amperes, in such a way that hardly 6 to 8% of them come back. The technique is very simple, in that the number of needles (20 to 40) are dipped in a water-filled glass bell held by the patient.

Radiotherapy of Cancer of the Cervix at the Radium Institute, Paris, France, Maurice Lenz, M. D., Am. J. R. and R. T., Mar., 1927.

The scope of this article is well exemplified in the conclusions of the author:

1. The technique of the treatment of carcinoma of the cervix by radium and roentgen rays should be influenced by anatomical, histological and bacteriological considerations and the clinical aspect of the case.

2. The technique employed at the Radium Institute of Paris represents an efficient method for this treatment with a small initial quantity of radium.

In conclusion, I wish to thank Prof. Regaud and his associates Drs. Lacassagne, Monod and Coutard for helping me to familiarize myself with the technique described in publication of this paper, and Miss Turnessen for help in collection of the records.

HIGH FREQUENCY CURRENTS IN GENERAL PRACTICE*

D. F. KNOTTS, M. D.
CHICAGO, ILLINOIS

With the high frequency currents in general practice we can cover a wide range of pathological conditions—both acute and chronic—and in many instances obtain results that are impossible with either medicine or surgery, or both.

Before going into the many uses of the high frequency currents in general practice, I wish to emphasize the necessity of a correct diagnosis before any treatment is instituted if we are to hope for permanent results with our treatments, as it is necessary to arrive at a correct diagnosis to be able to outline the proper treatment and to watch the progress of the disease. A correct diagnosis is just as essential when using physiotherapy as with medicine or surgery, and can only be arrived at after a thorough and painstaking examination and all findings checked up carefully—all foci of infection must be located and eliminated.

If the patient is absorbing toxins from any source whatever his vitality will be below par and he will not respond as he should to the treatment. Make use of the x ray and all laboratory tests that will be of assistance in locating any pathological conditions. Overlook nothing that will aid you to arrive at a correct diagnosis; a correct diagnosis is the real key to success in the practice of medicine. Good results cannot be expected without a correct diagnosis and the application of the proper technic. So we must not judge physiotherapy by the failures of the untrained.

With sedative diathermy we can create an active hyperemia in any diseased area, thus reducing congestion and producing a tendency to absorb soft exudates, which makes it a valuable agent and useful in a wide range of pathological conditions.

High frequency can be employed with gratifying results in the following conditions: Arthritis—traumatic or infective, neuritis, neuralgia, myalgia, rheumatic conditions, sprained ankle, bronchitis, pneumonia, pleurisy, osteomyelitis, trismus, nephritis, frontal sinus infection, prostatitis, seminal vesiculitis, orchitis, epidimitis, cervicitis, endocervicitis, pelvic cellulitis, post operative pelvic adhesion, dysmenorrhea, menostasis in young girls, acute and chronic specific urethritis in the male, high blood pressure, infection of the gall bladder—congestion, inactivity, torpidity or insufficiency of the liver, diabetes mellitus and diabetic ulcers of the leg.

With the spark from the Tesla current we can destroy such small and superficial growths as warts, moles, epitheliomas, etc. With the d'Arsonval current we can destroy diseased tonsils, hemorrhoids, carcinomas and all surface and accessible growths whether benign or malignant in character.

In the past few years there has been a decided improvement in the technic of coagulating tonsils. It is now not only possible to destroy diseased tonsils in the office without bleeding and with practically no pain, but there is practically no edema, soreness or bleeding following the operation, making it unnecessary to lose time from work or to miss a meal. This can be done during an acute infection if necessary without the danger of toxic absorption following the procedure.

When we use coagulation we do not have the troublesome granulation tissue to deal with as is so often the case following the surgical

*Read at fifth annual meeting, American College of Physical Therapy, Chicago, Oct. 20, 1926.

removal. It is not uncommon for a patient to eat a hearty meal within an hour after his tonsils have been coagulated. After-treatment or gargle is unnecessary as there is no pain.

With the tonsil electrode and handle I have devised you can coagulate any tonsil without the aid of an assistant or the use of a tenaculum. Buried tonsils can be brought into view from behind the pillars with ease (with this new electrode) and held there while being coagulated. The electrodes are made of tempered steel and sharpened so they are easily inserted into a fibrous or hard sclerotic tonsil to any desired depth, which is not possible with the aluminum electrodes now in general use.

Aluminum is a soft metal which bends easily when pressure is applied, and does not retain a sharp point. These new electrodes are curved at the point so they will easily slip down along the pillars and follow between the capsule and the tonsil; then slight traction brings the tonsil out in full view.

The electrodes can be adjusted in the handle to four different angles so that the operator can work entirely around the tonsil—from above downward, from below upward, or from either side to the center.

They fit into the handle at right angle so that the hand is not brought into the line of vision when operating. This handle can be used to advantage wherever desiccation or coagulation is employed.

In giving all sedative diathermy or auto-condensation treatments, you estimate the amount of current to be used before starting the treatment, then set the control switch accordingly, so you will secure this amount of current when all points of the gap are well open, but without having them open too wide at the time you have reached the maximum amount.

If the spark gap is open too wide, you do not get a smooth current—it is more of a rough or Faradic type. If the needle on the milliampere meter wavers or has a tendency to fluctuate, the gap is open too wide, and this will cause a rough current. Rather, open the control switch wider before starting the treatment, and it will not be necessary to open the gap so wide.

In a given case the amount of current to be used is estimated—say at 800 milliamperes. Set the control switch at 7 or 8; have the spark gap entirely closed. Next, cut in the current by opening the main switch. Now start the treatment by gradually opening the sparg gap until the milliameter reads 100; wait thirty seconds, open to 200; gradually turn it on 100 at a time, waiting thirty seconds after each 100, and continuing thus until the milliammeter reads 800. Continue the treatment for the length of time desired. In this way you secure a smooth flow of current throughout the entire treatment from start to finish.

The current has not been broken during this turning on process. To turn off the current, reverse the turning on process, but take only about half the time.

When giving auto-condensation treatments, the patient lies on the auto-condensation pad which is hooked up to one of the d'Arsonval binding posts. The other cord is attached to a 3x6 or 4x6 mesh, which is placed so that it covers the lower border of the liver, the gall bladder, the cystic duct, the several bile ducts, the head of the pancreas and the pancreatic duct, instead of having the patient hold the auto-condensation handle in his hands, which often causes the wrists to become tired and ache from so much current passing through them; there is no advantage in having the current pass through the arms.

On the other hand, there *is* an advantage in having the current pass through the liver, gall bladder and pancreas. The concentration of heat in this region increases the blood supply,

stimulates circulation in these two important glands, causes a thinning of the bile—thereby increasing the flow—and aide in emptying the bile ducts and the gall bladder, all of which is desirable in chronic conditions.

I always begin the first auto-condensation treatment with a small amount of current for a short period of time, say 300 milliamperes for fifteen minutes, and gradually increase the amount of current and time of treatment. Pay strict attention to elimination by giving laxatives and have the patient drink six to eight glasses of hot water daily, starting with two glasses one hour before breakfast.

In treating aged, debilitated or toxic patients and those that do not perspire freely, I increase the amount of current and time of treatment *very gradually*, and do not give as large a dose of auto-condensation as in treating a young robust person. Why? Because in the debilitated toxic case you are liberating a much greater amount of toxins to be taken care of by the blood and lymph streams, and the debilitated patient is not in a physical condition to withstand this sudden excessive liberation of toxins and dispose of them.

Auto-condensation produces heat in all tissues of the body, stimulates circulation, increases oxidation, hastens metabolism and elimination.

I therefore find auto-condensation a very valuable agent in old chronic conditions and where I want to hasten metabolism—in catarrhal conditions or infection of the gall bladder—congestion, inactivity, torpidity or insufficiency of the liver, multiple arthritis, diabetes mellitus, diabetic ulcers of the leg, etc.

Cases of diabetes where the urine contained as much as 240 grams of sugar in 24 hours, and with large diabetic ulcers of legs, were completely relieved by auto-condensation, the ulcers healed and sugar entirely disappeared from the urine. I also give the ulcers a ten-minute exposure with the therapeutic lamp and dress them with an ointment of equal parts of bismuth subgallate, zinc oxide and talcum powder, made into a thick paste with a vaseline base.

After starting with auto-condensation the ulcers rapidly take on a more healthy appearance and show signs of healing; the local circulation is improved and granulation appears soon after beginning treatment. The darkened area of tissue surrounding the ulcer begins to clear up and disappear. The healing of the ulcers usually progresses accordingly as the sugar disappears from the urine. Thirst vanishes and the urine becomes sugar free within a few months.

The general health of these patients improves until they have changed from sick, discouraged persons to those of health and well being, and this change takes place without insulin or the strict diet usually prescribed for these cases. I often give these patients as much as 1000 milliamperes of current for 30 minutes daily, later reducing to three times a week as they improve.

Cases of chronic prostatitis and seminal vesiculitis of long standing yield very satisfactorily to diathermy. I use a prostatic electrode in the rectum under the prostate and a 4x5 mesh above the pubis, having both electrodes well soaped before applying them. Use soap on the rectal electrode, as the jelly lubricants dry up from the heat and the electrode sticks to the mucous membrane and the patient will complain of soreness for a few days following treatment.

These treatments act as a rejuvenator and patients are very grateful for the benefits resulting from them, as they restore vigor and youth and increase the capacity for enjoyment.

In dysmenorrhea, amenorrhea and menostasis in young girls, I use diathermy with grati-

fying results. When it is inadvisable to use the vaginal electrode, I use a 6x6 mesh posterior and a 4x6 mesh anterior, held in place with large rubber sponges.

Fibrosis of a joint resulting from an injury, arthritis, or a fracture near the joint or where it has been kept in a cast or splint for a longer or shorter period of time without proper manipulation, where there is limited motion or stiffness of the joint, sedative diathermy, massage and manipulation will work wonders in restoring function and bringing the member back to full usefulness.

In stubborn cases of fibrosis that are slow to yield to diathermy, there is usually a focus of infection to deal with which must be located and eliminated. The condition will then respond more rapidly to diathermy.

Osteomyelitis usually responds favorably to diathermy treatments. All pain disappears early, pus from the sinuses becomes thin and less in quantity and a general improvement is soon noted.

The x ray will show that progress of the disease was arrested soon after starting diathermy. I also use general ultra violet light, calcium lactate and parathyroid in these cases.

Mrs. M. T., age 31, came to me with a blood pressure of 250 and a well developed case of nephritis. She had spent several weeks in a hospital on two different occasions during the previous two years for treatment of the nephritis and high blood pressure, with only slight and temporary relief.

On examination I found the patient had a severe colitis, and small, buried and badly diseased tonsils. When pressed slightly with a probe, pus would ooze from the crypts. I put the patient on a diet, treated the colitis, gave her auto-condensation three times a week and coagulated the tonsils. She was in such poor physical condition that I could coagulate only a part of one tonsil at the first attempt. One week later I coagulated the other tonsil and two weeks following this I finished the tonsil first treated.

I started auto-condensation with 300 milliamperes for fifteen minutes, with a mesh over the lower border of the liver and the gall bladder, gradually working up to 600 milliamperes for thirty minutes. I never gave this case over 600 milliamperes, as she did not perspire easily and therefore did not tolerate large doses well. She gradually improved and after five months the blood pressure was 145, nephritis entirely cleared up and patient was apparently well.

Dr. A. L., age 43, had always been well until two months before I saw him, when he had a severe case of tonsilitis followed in about two weeks by an attack of acute articular rheumatism. Most of the large joints were affected and some of the fingers and toes. Temperature was 103 to 104; had been delirious part of the time for three weeks. Had been treated with salicylates internally, sodium salicylate and sodium iodide intravenously, autogenous vaccines and local applications of 2 per cent mercurochrome to the tonsils twice daily—with unsatisfactory results. He had lost 65 pounds in weight and was a very sick man when I called on him at the hospital.

He was considered by the doctors in attendance to be in no condition for the surgical removal of tonsils. After looking him over I advised him to have his tonsils coagulated at once, to which he finally consented. I coagulated both tonsils while the patient was lying in bed.

The next day he said his throat was less sore than at any time since he took sick. In three days the temperature reached normal for the first time since he came to the hospital. He was given diathermy through the large joints and his arthritis cleared up rapidly. He has gained 55 pounds in weight, is feeling fine,

and a heart murmur that had developed during his illness has disappeared.

Many conditions that were formerly regarded as incurable are now known to respond to the high frequency currents.

DISCUSSION

DR. B. H. SHERMAN (Dexter, Iowa): There are so many things to mention regarding the uses of diathermy that it behooves us to take an inventory when we get such reports as this on the treatment of diabetes, for instance.

It is almost too good to be true, but these things we are finding more and more are true, and I think as we go along in the treatment of disease, as the doctor has pointed out to you, the one big feature is diagnosis. They used to tell me when I was in medical school that if you had a perfectly good diagnosis you could find the rest of it in the almanac. That may not all be so; nevertheless it is the foundation of medicine.

There is a point or two that I thought of while the essayist was reading his paper. The one thing in particular is the treatment of a simple earache. Here one should be careful in diagnosis to be sure that the ear is not suppurating, although I could report a case to you that was quite to the contrary, notwithstanding.

Doctors may bring you cases to have treated for earache and upon looking in the ear you may find some bulging of the membrane. That is a distinct contra indication for diathermy I had a case not so long ago that came to my office; in fact, he got me up at 1:00 o'clock at night, and he had a very severe otitis media, and on examination I found a bulging of the membrane. I was unable to convince him that the drum membrane should be punctured and the pus drained out. Inasmuch as I couldn't convince him of this I was compelled to treat him in some other way. I used diathermy with the fingers as the electrodes in the ear canals. To my surprise the next morning he reported to my office about 9:00 o'clock with complete relief. I looked in the ear and it was better. He wanted another treatment which I gave him. Two treatments effected complete relief.

DR. FRANK H. EWERHARDT (St. Louis, Mo.): Very briefly I will be glad to state that of the few ear cases we have come in contact with I have tried that.

Most all ear men are still skeptical and every once in a while I have to take measures to prove to them that there is virtue in the application of the high frequency current.

Without going into detail, just let me cite one case. A man who had not been able to recline for sixteen years because of asthmatic attacks, after everything else had been tried I was asked to take a hand. We placed him on an auto-condensation couch and tried various methods of auto condensation, one of which was the method which you all know, with the cylinder in the hand. Another one we used was the plate on the chest and we kept a careful record of his temperature. We did create several degrees of temperature and we kept a careful record of the results. During the whole treatment he said for the first time in sixteen years he was able to lie almost flat in the supine position in bed.

After a week or two he was getting along so well that we stopped the diathermy and the condition came back. His appetite also improved considerably. That is one case.

We had five other cases, two of which acted about the same way. The other three did not. In other words, three other cases we made favorable progress with.

When you think that you can benefit a man who has not slept for sixteen years, it is worth something to us.

DR. BELLE P. NAIR (Chicago, Ill.): In treating diabetic patients, does the doctor put the plate over the liver?

In cases of asthma could we have more detailed technic on the treatment?

DR. ST. PIERRE (Windsor, Ontario): I would like very much to have the doctor tell us of the increases in amenorrhea or dysmenorrhea and give us the technic, whether he applies the electrode on both ovari or treats with large electrode front and back.

DR. T. T. GIBSON (Middlesboro, Ky.): I would like to ask if he has used diathermy for typhoid fever. I have used it in a few cases myself.

DR. C. E. STEWART (Battle Creek, Mich.): In our research department the early part of this week we made an observation that may have been modified somewhat. That was the method of applying electrodes. It may have a more far reaching effect than this even in the application of high frequency currents.

One of our technicians, when I was examining one of the machines, wound about his arm an insulated cord. He noticed his arm became warm, heated up. That suggested an experiment. He took a glass tumbler two and one-half inches in diameter and filled it with water. About this cylinder was wound a No. 14 multi-strand insulated copper wire. The thermometer was placed in the center of this glass and the current turned on, I think about 3600 milliamperes being used. At the end of an hour the temperature had raised 40 degrees Fahrenheit. In the application of that current there was the insulation, glass cylinder and the insulated copper wire; nevertheless the temperature in the middle of that mass was raised 40 degrees in one hour.

Dr. D. Frank Knotts (Closing): The more I use diathermy the less I hesitate about using it where there is pus. I found, as the doctor has, many cases where it can be used to advantage. We should always use caution.

In treating diabetes we usually found that the lower border of the liver approximately on the lower border of the ribs is the place for the electrode. The center of the electrode is just about over the lower border of the ribs, and in a large patient 4x6 mesh placed here and I have a large rubber sponge that holds it in place. For a smaller patient weighing from 85 to 125 pounds, use a narrower electrode, a 3x6.

In dysmenorrhea or amenorrhea use the 6x6 mesh posterior, and a 4x6 anterior.

Typhoid fever is something we rarely see in Chicago. I haven't treated a case in five years so I have not had any experience at all with typhoid fever, but I would not hesitate to try it if occasion should arise.

I have one thing to say about the treatment of frontal sinus infections where there is pus. One case I think I reported before where a man's eye was entirely swollen and he hadn't slept for three nights. I got him to come to the office and one treatment with high frequency current, an electrode in the nose and another on the forehead, relieved his pain in ten minutes. When we took the electrodes out of his nose after a thirty-minute treatment, there was (I may be exaggerating) a half cup of mucous came out of his nose. I gave him twelve treatments following and he has gone through two winters without any reinfection. He has had no trouble since, and I have treated a number of others with the same results. It will stop the pain, and inflammation will subside on treatment if there isn't pus.

A New Type Applicator for Use in the Treatment of Malignancy of the Cervix, Ira I. Kaplan, M. D., Am. J. R. and R. T., March, 1927.

This applicator is a modification of the "curie colpostat" in use in the Curie Institute, Paris. It consists of a moulded rubber, elongated, H-shaped appliance of which the ends are cylindrical tubes connected by a rubber covered flexible spring. Individual single rubber cylinders are also used. The accompanying sketch shows more clearly the form and design.

The rubber cylinders are 3 cm. long by 1.5 cm. diameter, leaving a wall thickness of 0.5 cm. The material is pure metal free gum rubber specially vulcanized to give a spongy resiliency without the sponge absorption quality. The spring is specially tempered flat clock spring, 10 cm. long by 1 cm. wide by 0.2 cm. thick. It is just tense enough to spread the cylinders apart in the vagina, and keep an even pressure against the fornices and cervix. The spring is moulded into the cylinders and covered with the same quality rubber, but is vulcanized so that it is flexible, yet sufficiently non-stretching so as to hold the cylinders together.

These cylinders are stoppered at one end with rubber moulded in place, and the open end when filled with the radium tube is stoppered with removable rubber corks.

This applicator is inserted into the vagina through a large mouthed bivalve speculum. The cylinders are pushed in place on either side of the cervix and the spring tension keeps it there. The loose cylinders are placed against the cervix in front of the spring. One or more single cylinders may be used depending on the growth of the lesion and the width of the vaginal vault. Gauze packing is then inserted, so that the packing against the middle cylinders is held in place by the spring. Packing is placed between the anterior and posterior vaginal wall and the applicator to protect the bladder and rectum, and then a third packing is placed in the outer vaginal space against the spring holding the whole applicator in position. Crossfiring by the radium in the cylinders is thus accomplished easily on the local lesion and on the surrounding parametria. Before insertion, the applicator is sterilized by boiling, and may be dipped in boiling paraffin for further protection against absorption.

DIATHERMAL PENETRATION FROM THE CLINICIAN'S STANDPOINT*

H. D. HOLMAN, M. D.
MASON CITY, IOWA

We have reached our present state of development in an environment created by heat, light and motion. The action of light is superficial. The action of heat is deep, and motion is constant.

Heat in its varied forms plays the role of at least 50 per cent among our physical remedies.

Every systemic disturbance, whether traumatic or bacterially produced, is accompanied by a thermic reaction, which we call inflammation. In other words, "Inflammation is the specific reaction by which nature attempts to prevent delimit or repair damage being done or done in living tissue, regardless of cause."

Granted that conversive heat can be produced by a high frequency current, we have in diathermy an agent capable of producing an acute arterial inflammation of any degree of intensity desired.

Every normal inflammatory process, however, is more or less passive in type. Every normal inflammatory process is accompanied by a certain amount of unabsorbed exudate, which not infrequently becomes sclerosed.

With the possibility of conversive heat playing such an important part in relation to the deep seated lesions, it is readily seen why it is so important to establish the exact degree to which we get thermal penetration.

Diathermy should be fundamentally sedative in action, and if we get thermal penetration, as I believe we do, our therapeutic results should be in proportion to the benefit derived from a dilatation of the capillaries, a proper thermal elevation, and a consequent bacterial inhibition, with an absorption of debris brought about by the excess of fresh arterial blood to the part.

Taking the foregoing as a premise, I have accepted diathermy as a rational remedy, and have treated hundreds of cases, in each case expecting to accomplish everything that reasonably might be expected from heat properly applied to diagnosed and carefully selected cases.

In 1903 I placed in operation a 16-plate static machine. This instrument when equipped with two Leyden jars and with a transformer in the circuit, gave me a current of considerable volume, of very high voltage with low amperage. Bi-polar applications produced remarkable results, and it is to these results that I owe my present interest in diathermy.

In 1913 I purchased an instrument in cabinet form. This instrument was supposed to deliver D'Arsonval and Oudin currents, properly synchronised for therapeutic purposes, but after a few months clinical observation I was forced to junk the outfit, and it was not until 1923 that I again made the attempt to use conversive heat. Since that time I have met with sufficient success to satisfy myself, and to make converts of all those of the clinic with which I am associated.

Conversive heat is all we want, and I have clinically demonstrated to my satisfaction that no portable instrument will satisfactorily deliver it.

The following case reports have been selected to represent a class of cases that are beyond the realms of surgery or medicine.

*Read at Sixth Annual Meeting, American College of Physical Therapy, Chicago, Nov. 4, 1927.

This work was carried on with cabinet type of instruments. Of the two in use, one is of the high tension oil-immersed transformer type, and the other is of relatively low voltage and has a wax transformer. Both give a smooth, continuous current, and seem very well synchronised. This summer I placed one of the heavier type portable instruments in comparison and ran a series of cases for one month. Even the patients stated, many of them voluntarily, that the larger type instrument was much preferred, as the results in their estimation were materially better.

Case 1. Woman, aged 60, white, married. Large, rather corpulent. Came for relief of pain in right shoulder. Complained of uncomfortable feeling in the head. All other symptoms were negative. Blood pressure 200/90/.

June 5, 1926. Medication, oxyl-iodide. Also began a series of direct diathermy treatments, the last being on August 6, 1926. There was a total of 17 treatments, seven applied directly to the right shoulder and ten to the precordial region. Blood pressure 140/70/. The pain in shoulder and head symptoms relieved.

August 1, 1927. Patient returned because of pain and tenderness in the coccygeal region. She felt very well otherwise. Systolic pressure 140.

Case 2. Man, aged 65, white, married. Small, spare. Blood pressure 220/100/. Sclerosis of arteries very extensive. There was a general weakness, the patient often falling while going from one room to another. He had done no work for months.

November 3, 1924. Blood pressure 240/100. Medication, strychnine and potassium iodide. Also began a series of direct diathermy treatments to the precordial region. There was a total of 27 treatments, the last being given April 27, 1925. Blood pressure 170/100. The patient began improving soon after taking treatments, and by the first of the year was walking two miles to take his treatments.

October 6, 1925. By request, the patient came to the office for inspection. Blood pressure 140/95. Weight 125 pounds and was gaining. He said he had been working all summer, and was then wheeling brick in the brick yard.

I saw this patient again on March 1, 1926. He was ill with LaGrippe. Blood pressure 190/85. Ten days later I saw him again. He was much improved. Blood pressure 145/85.

Case 3. Woman, aged 65, white, married. Large, but not fleshy. Health good up to eight or ten years ago; since then she has been continually seeking medical aid because of gastric symptoms associated with shortness of breath and pains in the chest, radiating to the right shoulder. Several months of medication gave no better results than were previously obtained elsewhere. There was more difficulty in breathing, and the anginal pains were more severe. The blood pressure was erratic, the systolic would vary 40 to 50 points from one time to the next. June 25, 1924, I began a series of direct diathermy treatments, 19 in number. The last was given September 3, 1924.

The treatments were discontinued. The pain and shortness of breath were relieved, and she could walk eight blocks without any discomfort.

August 19, 1926, I was called to see this patient because of rheumatic pains in some of her joints. There had been no return of the heart symptoms and she said she had put in a very comfortable two years.

Case 4. Man, aged 62, white, married. Large and well built, but not corpulent. Health always good until recently.

March 26, 1924, he came because of a sense of fullness in the head and palpitation that had continued for six months. Blood pressure 210/110. Treatment, diet and laxatives.

March 29, 1924. Returned, feeling no better. Blood pressure 200/100. One and one-thrid pints of blood were removed and the patient felt relieved. Systolic pressure 175. Treatment continued, diet, baths and laxatives.

May 17, 1924. Patient felt better, blood pressure 180/94. Treatments were continued.

May 5, 1925. All symptoms returned. Blood pressure 240/115. One quart of blood removed and patient felt relieved. Systolic pressure 220.

October 21, 1925. Uncomfortable feeling in the chest. Head felt bad. Treatment continued.

About December 1 I began a series of direct diathermy treatments to the heart. Twelve treatments were given, the last one January 18, 1926. Blood pressure 180/80. He had had LaGrippe during the period and had discontinued the treatments.

April 7, 1926. Patient returned. Condition good. Blood pressure 155/80.

April 17, 1926. Patient returned. Condition good. Blood pressure 140/80.

July 6, 1926. Patient returned. Condition good. Blood pressure 160/85.

October 14, 1926. Patient returned. Condition good. Blood pressure 160/80.

I frequently meet this man at his work, and he is still feeling very good.

Case 5. Boy, aged 4, well developed and perfectly healthy since infancy.

April 8, 1923, he suffered an extremely severe attack of encephalitis. High fever and unconscious for over a week; paralysis of right side of face, weakness of right arm and leg, a paresis of the bowels, associated with severe indigestion, mentally impaired and unable to talk.

October 2, the mother brought this child to the office because of some peculiar spells he was having. She said they began in the middle of the summer. I found that physically and mentally the child had made very little change. The spells, without doubt, were epileptiform.

Advice sought elsewhere with the following prognosis: No hope of recovery and institutional care if the child lived. Luminal was given.

November 7, 1923. Convulsions getting much more severe. There were four or five seizures every day. There was a constant flow of saliva from the mouth. Few words could be articulated, and nearly all signs of intelligence were gone. At this juncture we began the use of direct diathermy to the brain. By December 15 the flow of saliva had ceased. It had been over a week since there had been a convulsion, and the child seemed much brighter. A total of 107 treatments was given, the last being May 28, 1924. The child improved gradually during this period, having only two or three light spells during the winter. At the termination of the treatments, physically and mentally the boy seemed normal.

The mother told me later in the year that she thought he had come near having an occasional spell, but that they had passed over. Unfortunately, I have been prevented from keeping this child under observation, as his parents moved to another state. However, his grandfather told me recently that the child was doing quite well.

Case 6. Woman, aged 32, white, married. Four children. Health good most of her life. Following confinement on December 1, 1918, she developed a double phlegmasia and was in bed four and one-half months. The left leg cleared up, but the right leg would swell to nearly double its size when she was on her feet. There was almost constant pain in the side and leg. It was with a great deal of difficulty that she could do house work.

September 2, 1925, she came to me with the prognosis that she would never get relief and all she asked was relief from the pain.

A series of direct diathermy treatments were given, a total of 27, the last being given January 19, 1926. At this time she was relieved of pain and swelling, and she could get around much better. Today the condition is completely relieved; she dances and goes up and down stairs with perfect ease.

The Role of Roentgenology in Medical Education. II Observations on the Alimentary Tract of the Medical student, T. Wingate Todd, M. B., etc., Am. J. R. and R.t., March, 1927.

In summarizing his study Todd states:

1. The study of the normal alimentary tract in health of young male students affords a criterion for observation of pathological condition.

2. All parts of the tract are exceedingly sensitive to emotional or nervous conditions. These influence different parts of the tract in divers directions. The stomach becomes atonic in outline though not in movement nor in emptying time. The duodenum shows pseudostasis. The transverse colon exhibits a spasm which may absolutely inhibit the onward passage of contents.

3. The sites of cardia and pylorus are affected in similar manner though not so greatly as are the positions of the greater curvature in the pyloric vestibule and gastric tube.

4. The normal position of the small intestine in the living, whether upright or horizontal, is in the lower abdomen and true pelvis: its dispossition is in ladder coils.

Peristalis in the lower ileum may be exceedingly slow in spasm of the transverse colon, one wave taking half an hour to complete its cycle.

6. The proximal colon (cecum, ascending colon, transverse colon) exhibits a peristaltic wave like those of the stomach and small intestine. Its rate of progress in the transverse colon is about half that of stomachic peristalsis.

DIATHERMY IN THE TREATMENT OF GONORRHEAL INFECTIONS IN THE MALE*

EUGENE B. PERRY, M. D.
CHICAGO, ILLINOIS

Advances in therapeutics often depend on the correlation of long known facts regarding bacteria and disease with recent improvements in the application of an old time-tried therapeutic agent. The recent war was the opportunity required by the silver protein salts to prove their long known gonococcocidal value in prophylactic treatment. The sovereign remedy in acute as well as chronic gonorrheal infections will develop from the long known susceptibility of the gonococcus to heat combined with the accurate penetrating heat of medical diathermy as applied in new electrodes.

The action of heat in providing local active hyperemia causes increased diapedesis of leucocytes and transudation of opsonins and antibodies at the site of invading organisms. Diathermy heat exhibits all the qualities of ordinary heat, more constantly and to any desired depth and degree. This penetrating, even thermometer controlled heat is not only capable of attenuating pathological organisms, but actually kills gonococci without apparent damage to the surrounding living tissue. Reports of many workers show that gonococci are killed in living tissue with a temperature of 113° Fahrenheit maintained over a period of thirty to forty minutes, and at 108° Fahrenheit maintained over a period of three to four hours. My experience tends to confirm findings.

In the acute anterior gonorrheal urethritis, the initial lesion of all gonorrheal infection in the male, the gonococci invade the epithelium, of the crypts of Morgagni rapidly within thirty-eight hours after innoculation, and diapedesis is well established at this time. Three days after innoculation the entire surface, folds, crypts and glands are filled with pus. Gonococci are numerous in the leucocytes and free in and around the cylindrical epithelium and gland ducts, perifollicular regions and even in the meshes of unprotected connective tissue. The buried location of the organism accounts for the inability of the silver salts to reach and eradicate the gonococci after infection has once been established as evidenced by muco-purulent discharge.

Since the infection in acute anterior gonorrheal urethritis is located entirely in a practically pendulous organ it was not difficult to select an electrode which would bring the diathermy current to bear on the infected area with seemingly killing effect without violating any rule of previous medical practice.

The Fischer Urethral Electrode was selected with some modifications. This electrode is composed of two slightly concave plate electrodes four and one-half inches long, set on a rigid supporting frame of hard rubber. The dorsal plate is one and one-eighth inches wide, straight on its cylindrical axis and not adjustable. The ventral plate is seven-eighths inch wide up to one and one-eighth inches of its proximal scrotal end where there is a lateral expansion to one and one-eighth inches and a downward, outward bend at a 45° angle. The ventral electrode is set on two screws in the rigid frame to be adjusted at varying distances from the dorsal plate. Both plates are connected to separate posts on the outer end of the rigid circular frame and both plates are detachable for sterilizing purposes.

Treatment in my cases consisted of hygienic and local medical measures combined with diathermy applications which avoided introducing any electrodes directly into the acutely inflamed anterior urethra.

*Read at fifth annual meeting American College of Physical Therapy, Chicago, October 2, 1926.

The patient was directed to abstain from alcohol, salty, spiced and protein food, and observe complete sexual rest. He was advised to drink at least one or more glasses of water an hour. In addition he was cautioned to keep off his feet as much as possible and to avoid striping the urethra. Medical treatment consisted in temporarily alkalinizing his urine and, after emptying his bladder, urethral injections every four hours of a drahm of 5 per cent argyrol solution which was retained six to eight minutes.

The diathermy treatment consisted of snugly enclosing the penis with the whole pendulous and scrotal urethra between the ventral and dorsal electrodes after lubricating these plates with the prepared soap. The indifferent pole attached to the dorsal post and the active pole to the ventral post. Then the patient is cautioned to keep his hands behind his head and the current turned on and gradually stepped up at five-minute intervals to the point of toleration. On several occasions I have reached 750 milliamperes without serious complaint. By occasionally inserting a bare thermometer a short distance in the urethra an accurate idea of the temperature developed may be thus obtained. This latter procedure is only infrequently resorted to and is only occasionally necessary. My temperature range, I discovered to be between 110° and 114° Fahrenheit and was accomplished without discomfort to the patients. The length of each treatment depended upon the temperature I was able to develop and varied between thirty to sixty minutes. The patient is then allowed to urinate and an injection of 5 per cent argyrol given. One must remain in constant attendance during the treatment as the penis changes in size frequently, thus diminishing the area in contact with the electrodes, requiring readjustment after momentarily turning off the current. These treatments are given daily or every other day, depending on their individual length, the temperatures developed and the patient's tolerance. Should the patient have a very profuse discharge it seems advisable to diminish the length of the treatments and give them more frequently in order to prevent the damming back of purulent material into the posterior urethra.

Following the above technic in twenty-one cases where the diagnosis was confirmed by two-glass tests and the gram negative intracellular diplococcus obtained in smears with a history of one to four days duration, I have found all clinical symptoms and signs to disappear in every case after three to seven days' treatment. The average number of days was five. However, both diathermy and medical treatments were continued for seven to ten days after the disappearance of symptoms.

My results have been very gratifying to me when I remember the disastrous results obtained by old abortive measures with strong solutions, usually resulting in a stubborn, prolonged course of the disease with many deeper complications. The milder conservative treatment with weaker solutions usually extended from four to six weeks, providing that posterior complications did not arise. The results obtained in this stage of the disease with the combination of medical and diathermy treatment have a logical background and when compared with other methods pay the patient and physician handsomely for the extra amount of the physician's or technician's time consumed in the application by practically aborting the disease and preventing complications.

The modified electrode just described has proved itself superior to other urethral electrodes, including the home fashioned combination of body electrode and suspension of penis in salt solution. With the newer instrument the anterior urethra is able to receive an evenly distributed, well localized, diathermy heat throughout its longitudinal axis.

Acute complications of anterior urethritis are managed by using the same electrodes in the same manner. A treatment of forty min-

utes' duration given on three alternate days succeeded in resolving acute peri-urethral abscesses in five instances to such an extent that it was possible to obliterate their cavities by coagulation on the seventh day. Ordinarily these abscesses cannot be treated by surgical measures for three to six weeks after their appearance.

Acute posterior gonorrheal urethritis is an extension of an anterior urethritis which still exists, but is usually over shadowed by the stormy reaction of the more serious complication. Treatment again combines the same hygienic and local medical management with the same diathermy applications to the anterior urethra. In addition, the membraneous and prostatic portions of the posterior urethra are treated with diathermy applied with the prostatic electrode in the rectum. These treatments are given on alternate days, avoiding days when the anterior urethra is receiving treatment. The manner in which the prostatic electrode is used does not differ from the method described later in the case of prostatic disease with the exception that massage is not necessarily utilized.

Chronic disease of the anterior and posterior urethra is managed in much the same manner as the acute conditions. Inflammatory bands must be located and ironed out with suitable sounds and bougies. Urethroscopy with Young's instrument will aid materially in stubborn cases by locating follicular abscesses, infected glands or an inflamed utricle permitting direct local treatment with drainage, fulguration or silver solutions.

Heretofore, the management of the acutely inflamed, exquisitely tender prostate to the stage of resolution when the infected contents can be expressed with little danger of dissemination has been slowly accomplished by applying heat locally with hot rectal irrigations, electric pads and sitz baths. In spite of these superficial, inaccurate, uncertain procedures, the common application of heat has been successful in allaying pain, dysuria and in bringing about the slow localization of the inflammatory process. Medical diathermy administered through the rectum with the prostatic electrode containing a thermometer localizes this invaluable heat, which is capable of penetrating to any depth and remaining constant under accurate control. In addition to all the favorable results of heat more efficiently applied, diathermy supplies a heat of marked bacteriocidal quality.

The prostatic application is made with the patient in the supine position. A large block tin or mesh electrode (8x10 in.) is placed low over the well soaped, supra-pubic area and snugly bound in place with four-inch elastic bandage, and is then attached to the indifferent terminal. The prostatic electrode, with metal side up, is lubricated with soap and slowly inserted a distance of three to four inches into the rectum without rotating. This is then connected with the high frequency terminal and the weight of the cord holds the metal face of the electrode against the posterior surface of the prostate. The positions of prostates vary as much as one to two and one-half inches from the anus, and this distance must be estimated before inserting the electrode. The thermometer is inserted in the body of the instrument and the current gradually turned on and stepped up at five-minute intervals to the point of tolerance, which is usually found to be about 112° Fahrenheit. The average range is 110° to 114° Fahrenheit which is maintained for thirty minutes of an hour application, and fifteen minutes of a half-hour application. Treatments are given every day, or every other day, depending on the reaction and toleration of the individual. Six to eight of the one-hour treatments, or the equivalent thereof constitute a course of maximum intensity without rest.

By the fourth day in the very acute cases, tenderness has usually disappeared to such an extent that gentle massage may be instituted. In subacute and chronic cases each treatment

is followed by a prostatic massage and the expressed material is washed out by urination, and then followed by an instillation of 10 per cent argyrol or 2 per cent mercurochrome solution into the posterior urethra. No massage or treatment is given the prostate on the same day that sounds are passed or treatment is given the anterior urethra.

The exquisitely tender, acute prostate, after three diathermy treatments, becomes ameanable to drainage by gentle massage. In the chronic cases the gonococci disappear rapidly from the expressed secretion in from three to five weeks of active treatment. In the last five acute prostatic abscesses treated in the above manner, drainage into the urethra and resolution occurred very rapidly. The acute retention and dysuria are usually relieved after one treatment and catheterization.

Acute and chronic seminal vesiculitis are treated in much the same manner as the usually concomittant prostatitis. Consequently, treatment of both organs is accomplished at the same sitting by inserting the prostatic electrode one to two inches deeper within the rectum and using the rectal sphincter as a fulcrum and holding the distal end of the electrode at a 45° angle with the mid line to the right and the left side. When treating the seminal vesicles and prostate concomitantly, the right and left vesicle each receive fifteen-minute applications of the whole hour treatment. Massage of the seminal vesicles is included at the time of the prostatic massage.

Gonorrheal arthritis should be treated as a complication of posterior urethritis, prostatitis or seminal vesiculitis. In applying diathermy treatment to the joint itself the contributing foci described above cannot be overlooked if lasting results are to be obtained.

Epididymitis was the first form of gonorrheal complications to receive real medical diathermy attention. The splendid results obtained and the methods of application are too well described by other men for me to attempt it here.

1305 East Sixty-third Street.

Radiation Therapy in the Treatment of Inoperable Carcinoma, B. C. Cushway, M. D., and R. J. Mayer, M. D., Illinois M. J., April, 1927.

These authors believe that of the numerous inoperable carcinomas which are observed 15 per cent become operable under proper radiation therapy. Among those lesions where the lesion cannot be made operable 50 per cent are so retarded in growth and in effect upon the patient that life is lengthened from six months to two years in comparative comfort. Radiation will relieve the pain in about 70 per cent of carcinoma patients. This may even hold true for the metasases that are almost sure to develop. Radiation therapy will heal over many of the large ulcerating masses, eliminating the most disagreeable odor and discharge.

Six cases are described as illustrative of the authors' views. Radiation, they contend, is not a cure for inoperable carcinoma, nor is it a specific for malignancy. It will, however, give favorable results in a large number of cases and this is more than any other form of palliative treatment has accomplished.

The Roentgen Ray in the Treatment of Skin Disease with Special Reference to Acne Vulgaris, J. Edgar Fisher, M. D., Ohio S. M. J., May, 1927.

A comprehensive review of this important subject leads Fisher to conclude that:

1. With modern apparatus and proper precaution, the roentgen ray can be accurately measured and used in many of the commoner skin disorders with perfect safety.

2. At the present time it is the most valuable local agent we possess in the treatment of acne vulgaris, lichen planus, eczema and dermatitis. In psoriasis, it should be used with caution.

3. Excellent results are being obtained in verruca plantaris, epithelioma of the skin and ringworm of the scalp.

4. Among other diseases it has proved its worth as an antipruritic agent in pruritus, ani and vulvae. In mycosis fungoides it is the method of choice in checking the progress of the disease in the early stage and in relieving the intense itching.

EDITORIAL

ARCHIVES OF PHYSICAL THERAPY, X-RAY, RADIUM

DISRAELI KOBAK, M. D., Editor

Suite 820—30 North Michigan Avenue, Chicago, Illinois.

Original contributions, exchanges and books for review should be forwarded to the Editorial Office. All business matters including advertising should be handled through the office of the managing editor, 1216 Medical Arts Bldg., Omaha, Nebraska.

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ALBERT F. TYLER, M. D., Managing Editor

Published monthly at Omaha, Nebraska, by the Magic City Printing Company.

Seventh Annual Meeting, Chicago, September, 1928

PHYSICAL THERAPY IN INDUSTRY

That physical therapy intelligently applied in conjunction with other methods of industrial surgery will materially reduce "time off" after injury is amply proven. The experience of one steel plant is typical of many others. Due to the character of the work in this particular plant fractures of the metacarpal and metatarsal bones are very frequent. Formerly the period of disability was long and consequently the compensation insurance outlay exceedingly high. After a period spent in cooperative research by the medical and insurance branches of this plant a scheme of treatment was outlined which reduced by half the period of disability following practures of the hands and feet.

This scheme of treatment may be briefly outlined as follows (1) Accurate reduction; (2) Efficient retention in good position; (3) Physical therapy from the beginning; (4) Early active use of the injured member.

Accurate reduction was sought for and actually produced in each case by application of surgical principles combined with frequent check by x ray.

Efficient retention was made possible by the introduction of some specially devised splints made of wood so as to be pervious to x ray, thus making it possible to frequently ray the part to determine whether the retention was accurately maintained. These splints were standardized for adults.

Physical therapy was applied in the form of radiant heat followed by massage, thus keeping up the muscular tone.

Active use was urged from the beginning, the specially devised splints being of such shape that even though a patient had a fractured metatarsal bone he could walk on the foot without misplacing the fragments. By employing the above treatment it was found that the injured employee could return to work in half the time previously thought necessary and the end result was much better function than had formerly been possible.

A. F. T.

WESTERN ASSOCIATION OF PHYSICAL THERAPY

With nine years of earnest endeavor to its credit, this association enters upon its tenth year with a determination to outdo all previous sessions in scientific work. The president, Dr. J. E. G. Waddington, who is noted for his energy and sincerity of purpose, is putting his whole heart and soul into the preparation of a program, assisted by an able committee, headed by that live wire of Louisville, Dr. A. D. Willmoth. The beautiful Aztec room of the Hotel President will again be the scene of the association's activities, and Mr. Franklin Moore, the genial manager, has reserved one entire floor for our members, so that communion of kindred spirits may be engendered between the sessions.

Ten adjoining rooms have been reserved by our good friends, the manufacturers, whose loyalty to our association is as gratifying as it is demonstrative. Every creation of inventive brain will be displayed for the benefit of those in attendance, while technic will be shown by experienced operators. Ample time will be allowed for these demonstrations before the entire class.

Dr. William Benham Snow and Dr. Mary Arnold Snow, whose presence is always an inspiration, will again be guests of the Association.

Preliminary report of the chairman of the program committee. There are several more papers from prominent men who will be ready for report later. The coming session of the Western Physical Therapy Association promises to be one of the best, if not the best, in its history. Essays are coming in nicely.

Dr. Jos. E. G. Waddington - Detroit, Mich.

Presidential Address

Physical Therapy, What It Is, What It Should and Shall Be.

Dr. Burton B. Grover - Colo. Springs, Colo.

What's in a Name?

Committee on Research Report from the Dean of the School.

Dr. J. C. Elsom - - - - Madison, Wis.

Physical Therapy, Positive and Negative

Dr. Mary Arnold Snow - New York City

The Use of Static Methods in Gynecological Conditions.

Dr. William Benham Snow - New York City

Observations on, and the Treatment of Infantile Paralysis

Dr. Curran Pope - - - - Louisville, Ky.

The Psychology of Physical Therapy

Dr. Edw. N. Kime - - - Indianapolis, Ind.

Problems in Physical Therapy Education

View Exhibits

Dr. Edwin Lee Libberts - Indianapolis, Ind.

Actual Results Obtained in a Large Number of Private and Hospital Cases

Dr. Norris - - - - - Indianapolis, Ind.

Present Status of Physical Therapy in Dental Practice.

Dr. Geo. E. Knappenberger - Kansas City, Mo.

Spinal Nerve Rediculitis Simulating Visceral Disease Case Reports with Comments

Dr. Frank Walke - - - - Shreveport, La.

The Value of Physical Therapy in Industrial Practice

Dr. F. H. Ewerhardt - - - St. Louis, Mo.

Lower Backaches

WESTERN SCHOOL OF PHYSICAL THERAPY

For nine consecutive years this School has given needed instruction in the practical fundamentals and the practical application of practical or physical therapy.

This year, the tenth session will be held at the Hotel President, 14th and Baltimore Avenue, Kansas City, Mo., commencing Monday morning, April 16th, 1928, continuing for four intensive days and evenings.

There is no present need to expatiate upon the status of physical therapy or its value; the A. M. A. has officially recognized its scientific importance by the appointment of a Council on Physical Therapy; and the American College of Surgeons does not officially recognize a hospital unless equipped with a physical therapy department.

Nevertheless, what the medical profession in general does not yet quite recognize, is the fact that physical therapy is equally as important as surgery and medication; that only a due appreciative correlation of these three essential components or divisions of the healing art can satisfactorily constitute the science as well as the art of medicine; and that so important and valuable a subject as physical therapy requires no less study and experience than does surgery and drug medication in order to acquire practical as well as theoretical proficiency.

Physical therapy cannot be practiced without certain appliances; but neither can the possession of even unlimited apparatus and its occasional use thereby alone raise the apprentice to the "master's" degree; neither—similarly—can the possession of surgical instruments and their occasional use thereby transform the user into a master surgeon.

Much time may be saved, and valuable experience quickly gained, by attendance at the 1928 session of the Western School of Physical Therapy. The faculty will consist of practitioners, who not only have many years of experience in general medicine and surgery but, additionally, have worked, written, and lectured upon all phases of physical therapy year after year and with each succeeding year bring to the School not only the old and tried, but also the ever increasing and developing newer methods and ideas of scientific, practical physical therapy.

For the neophyte, the essential fundamentals or physics of the various agencies will be simply and concisely explained, so that even the most reluctant intellect may clearly and interestingly comprehend; later, the practical demonstrations of technique—old and new—in which the class actively participates, will enable even the experienced to discard certain obsolete ideas and methods and substitute something worth while which shall amply repay them for their attendance.

Attendance will be strictly limited to ethical physicians, or technicians, properly sponsored.

The tuition fee will be $30.00, as usual, for complete course.

INSTRUCTORS

Burton Baker Grover, M. D., Colorado Springs. Author of Handbook of Electrotherapy, High Frequency Practice and Epitoms on Blood Pressure. Ex-president W. P. A.

William Benham Snow, M. D., editor of Physical Therapeutics. Ex-president American Electrotherapeutic Association. The foremost exponent of physical therapy in America. Thirty years as a teacher.

Mary Arnold Snow, M. D., New York, for many years a prominent practitioner of physical therapy. Author of "Mechanical Vibration and Its Therapeutic Application" as well as many valuable contributions to the literature of physical therapy.

Joseph E. G. Waddington, M. D., Detroit. President of the Western Association of Physical Therapy. Author of Practical Index to Electro-Physiotherapy. Recently visited Europe, where he became familiar with physical therapy technic of the leading hospitals of England, France and Germany.

James C. Elsom, M. D., Madison, Wis., Professor of Physiotherapy, Medical Department University of Wisconsin.

Edwin N. Kime, M. D., Indianapolis. Professor of Physiotherapy, Medical Department, University of Indiana.

A. David Willmoth, M. D., A. M., Louisville, Ky. High Frequency Surgeon, ex-President of Western Association of Physical Therapy.

EUROPEAN TOUR
AMERICAN COLLEGE OF
PHYSICAL THERAPY
1928

To Attend Lectures - Clinics - and Visit the Leading Centers of Physical Therapy

Mindful of the great benefits to be derived from first hand contact with European leaders in our profession, *The American College of Physical Therapy* invites you to attend a series of lectures to be held at the leading centers of physical therapy abroad. You will note the itinerary has been very carefully planned to give ample time for clinics and lectures as well as an opportunity to visit principal points of interest in the various cities. While en route on the Atlantic liner a systemized course of lectures will be given on physical therapy by two leading teachers in this special work. There will be demonstrations and personal conferences in all branches of electro-physical therapy.

The steamships used are well known Cunard cabin boats offering every comfort at minimum rates, and only hotels of repute will be used. For those desiring to attend the Radiological Congress at Stockholm in July an extension tour can be arranged at very little additional cost. Ladies are welcome, special provisions having been made for their diversion while the doctors attend the lectures and clinics.

The membership fee is $977 from New York to New York, which includes all steamboat, railroad and motor car fares, hotel accommodations with table d'hote meals; all sightseeing, as provided in the itinerary, and all tips to hotel staffs and baggagemen, except in England where tipping en masse is resented. A large suit case is presented to each member, which will be transported through the trip free of charge.

This is an unusual opportunity for the doctor to combine a pleasure trip with one that will give him a very intensive course in physical therapy, together with close observation of the work in this specialty that is being carried on by the pioneers of Europe. The instruction course which will be offered on the voyage en route will in itself give the doctor:

(1) An opportunity to acquaint himself with the fundamentals and practical experiences of recognized specialists. This means that it is not absolutely necessary for one previously to have had any experience with the use of physical agents.

(2) An intensive and thorough review course in every branch of electro-physical therapy as employed in all the various specialties of medicine and surgery.

The visits at the various hospitals and clinics in the prominent cities of Europe and the personal contact with the clinicians who have developed physical therapy will tend further to augment the preliminary instruction work. All in all, this combined and systematized method of offering such an intensive plan should indeed be an attraction to every physician. *The American College of Physical Therapy* is very glad to offer this means to its fellows and other physicians who are interested in physical therapeutics.

ITINERARY

May 26. Sail from New York.
June 4. LONDON.

June 5. St. Bartholomew's Hospital.
June 6. Middlesex Hospital.
June 7. London General Hospital.
June 8. Lord Trelor Hospital.
June 9. Leave 9 a. m. Arrive Paris 4 p. m.
June 10. PARIS: Motor to Versailles.
June 11. Sal Petre & American Hospitals.
June 12. Prof. D'Arsonval's clinic.
June 13. Dr. Riviere's clinic: Hotel Dieu.
June 14. Guests of Soc. Electrotherapy
June 15 and Radiology of France.
June 16. Leave 8 a. m. Arrive Lausanne 5:20 p. m.
Leave 8:25 p. m. Arrive Montreux 9:07 p. m.
June 17. MONTREUX. Castle of Chillon.
June 18. Motor to Leysin. Prof. Rolliere's clinic.
June 19. Leave 11:05 a. m. Arrive Zurich 7:06 p. m.
June 20. ZURICH. University of Zurich.
June 21. Leave 8:24 a. m.
June 22. VIENNA. Dr. Kowarchik's clinic.
June 23. Allgemeine Krankenhaus.
June 24. Pottsdam.
June 25. Kaiser Jubilaum Spital.
June 26. Other clinics and hospitals.
June 27. Leave 8 a. m. Arrive Berlin 10:27 p. m.
June 28. BERLIN. Dr. Rudolf Verchow Krankenhaus.
June 29. Dr. Nagelschmidt's clinic.
June 30. Other clinics.
July 1. Leave 8:20 a. m. Arrive Copenhagen 7:05 p. m.
July 2. COPENHAGEN. Finsen Institute.
July 3. Dr. Carl Sonne's Laboratory.
July 4. Sail for New York.

Above tour subject to change at discretion of Director of Travel.

For further information address *The American College of Physical Therapy*, travel department, 25 Broadway, Suite 656, New York, N. Y.

The Treatment of Fibroids and Abnormal Uterine bleeding Due to Benign Diseases by Means of Radium and Roentgen Rays, J. Thompson Stevens, M. D., Physical Therapeutics, May, 1927.

This subject is discussed at great length. The author gives the technique by roentgen therapy and also by radium for the management of these cases. The results of treatment in a series of cases are cited, after which the auther states in conclusion:

1. The more recent literature on the treatment of fibroids and abnormal uterine bleeding due to benign disease is reviewed briefly.

2. Many of the most able gynecologists and radiotherapeutists agree that radiation therapy properly given is practically a specific in the types of cases under discussion.

3. No case is included in this paper that was not treated prior to January 1, 1925, i.e., the most recent case included has been under observation since treatment was completed approximately one and one half years. This plan gives the time factor ample opportunity to show up the exact end results. The earliest case treated in my own clinic dates back to 1918.

4. Analysis of my own cases treated shows one hundred per cent castrations produced in the fibroid cases; thirty-two in the childbearage age have been treated with radium, twenty-eight now have perfectly normal periods while four have had to be castrated because of recurrence of hemorrhages; twenty-six cases of benign hemorrhage at the menopause have given twenty-four perfect results, with two who have infrequent "spotting" instead of severe hemorhages; sixteen cases included under adnexal disease and hemorrhage due to pregnancy have given one hundred per cent results; and eleven cases of dysmenorrhea gave two perfect results, five cases improved, and four not improved.

5. This report is based upon a total of 203 cases prior to January 1, 1925.

THE STUDENT'S LIBRARY

BOOKS RECEIVED

This column is devoted to acknowledgment of the books received. Such acknowledgment must be regarded by the sender as sufficient recognition of the courtesy until time and space permit selections to be made for review.

UROGRAPHY. By *William F. Braasch,* M. D., head of section of Urology, Mayo Clinic; Professor of Urology, Graduate School of Medicine, University of Minnesota. Second edition, revised and enlarged. Octavo of 480 pages. Illustrated with 759 roentgenograms. Philadelphia and London; W. B. Saunders Co., 1927. Cloth, $13.00 net.

AN INTRODUCTION TO THE HISTORY OF MEDICINE. By *C. G. Cumston,* M. D., Lecturer on the History of Medicine and Medical Philosophy in the University of Geneva; Fellow of the Royal Society of Medicine, London; Member of the Permanent Committee of the Int. Soc. of the History of Medicine, etc. Pp. 380. Illustrated. New York City: Alfred A. Knopf, publisher.

NERVE TRACTS OF THE BRAIN AND CORD. By *William Keller,* F. R. C. S., Editor, Professor of Anatomy and Applied Anatomy, University of Texas. Pp. 455. Illustrated. New York City: The Macmillan Company, 60 Fifth Ave.

BOOKS REVIEWED

INTERNATIONAL CLINICS. Edited by *Henry W. Cattell,* A. M., M. D., with collaboration of leading members of the medical profession. Cloth. Pp. 308 with 74 illustrations. Philadelphia: J. B. Lippincott Co., 1927.

A quarterly of illustrated clinical lectures and especially prepared original articles, the "International Clinics" occupy an important place in current medical literature.

In this, the second volume of the thirty-seventh series, the material has been divided into nine sections. In the first on diagnosis and treatment, W. Storm Van Leeeuwen of Leiden, Holland, presents the relation of climate to allergic diseases. Louis F. Bishop offers a heart-block clinic, followed by L. Pierce Clark's discussion on the physical and psychic basis of a neuropathic constitution. Henry Keller relates the significance of trauma in the caudal region of the spine. Bunion, Its Cause and Cure is given by H. A. Robinson. The pathological aspects of anal and of rectal neoplasia are enumerated by George T. Pack. The section is complete with W. T. Longscope's discussion of multiple myeloma.

The section on medicine opens with Lewellys F. Barker presenting a case history and discussion of diagnosis and treatment of psychasthenic state and of schizothymic personality. William E. Robertson discusses the social economic phase of heart disease. The diagnosis of nerve syphilis in the absence of a positive spinal fluid is presented by Paul E. Bowers, followed by a discussion of certain problems of prostatic hypertrophy by Joseph L. Tenenbaum.

Surgery is introduced by John B. Deaver's article, Mucinous Carcinoma, followed by Frederick Christopher's discussion of severe compound fracture of the radius and ulna. J. F. Montague presents the successful treatment of pruritis ani. The surgical patient in extremis is an important subject adequately handled by G. S. Foster.

Public health supervision of country day schools is discussed by Richard M. Smith, followed by S. T. Nicholson's presentation of the care for the health of the preparatory school student.

Medical history section is handled by John Rathbone Oliver.

Another section is completely devoted to Travel Clinics.

The Post-Graduate Study is conducted by Henry W. Cattlee and Walter S. Cornell.

An eighth section is devoted to the address of President Coolidge before the Washington meeting of the American Medical Association.

PHYSICAL DIAGNOSIS. By *Richard C. Cabot,* M. D., Professor of Medicine, Harvard University; formerly Chief of West Medical Service at Massachusetts General Hospital. Ninth edition. Cloth. Price, $5.00. Pp. 536. Revised and enlarged, with six plates

and 279 figures. New York: William Wood & Co., 1927.

Eight editions since the original publication in 1905 suggest the recognition that this text has been given by the medical profession. Request a physical diagnosis text for a student and one immediately thinks in terms of Richard S. Cabot. To physical diagnosis this text occupies the same standard as Gray does to anatomy and Howell to physiology.

For the second and third year student of medicine no better unification of clinical and laboratory diagnostic methods could be accomplished. The false distinction between clinical diagnosis and laboratory diagnosis is broken down by describing the methods of examining an organ in a single section. Its value as a textbook is unquestioned.

For the practitioner this book serves as a rapid reference text to the various diagnostic methods and processes needed to obtain a diagnosis. Only those methods that have been found of distinct value in the hands of the author have been included.

Cabot's "Physical Diagnosis" has a definite place in the development of the medical science.

The reviewer in passing wishes also to recall an analysis made by the same author on heart disease. His work on "Facts on the Heart" deserves the attention of every internist.

SURGERY OF THE STOMACH AND SMALL INTESTINE. By *J. Shelton Horsley*, M. D., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. Surgical monograph under editorial supervision *Dean Lewis, Eugene Pool* and *Arthur W. Elting*. Cloth. Pp. 325 with 153 illustrations. New York: D. Appleton & Co., 1926.

A surgeon with no mean experience, Dr. Horsley has been a great contributor to surgical literature. His literary career began as a young practitioner of 27 years when he became editor of the New York Polyclinic Medical Journal. He has since been co-author of "American Practice of Surgery" and author of "Surgery of the Blood Vessels" and "Operative Surgery."

This monograph, the latest of his achievements, we would expect to be the greatest. Editorially it should fulfil the principles of journalism and be a pleasure to the reader. Didactically it should depict the work of a scholar and teacher. Practically it should embody a wealth of personal experience and observation. The monograph fulfills all expectations.

"The true ideals of an operation are to remove or correct the pathologic conditions and to restore as far as possible the physiologic function." But the physiology of an organ can be comprehended only after consideration of its embryology and its gross and histologic anatomy. Much time and space is devoted to these fundamental subjects. The methods used in diagnosing various gastro-intestinal conditions and the analyzing of symptoms are carefully considered.

Fundamental procedures are then individually considered. Suturing of stomach and small intestine, gastrotomy and gastrostomy, pylloroylasty, gastroenterostomy, resection and excision of ulcers, partial and total gastrectomy—all are included and admirably illustrated. Clinical entities—pyloric stenosis, ulcers of stomach, duodenum and jejunum, intestinal obstruction, etc.—all are discussed. An effort has been made to base operations and procedures as far as possible on biologic principles, and only those which seem to have such a foundation have been adopted.

For the young surgeon this monograph should be of utmost importance as a guide to gastro-intestinal procedures.

NEPHRITIS. By *Herman Elwyn*, M. D., Assistant Visiting Physician, Gouveneur Hospital, New York. Cloth. Pp. 347, with few illustrations. New York: Macmillan Co., 1926.

No organ has been so mystifying, no clinical class of diseases as varied and as theorized as the kidney, normal and pathological. It has been only after the most tedious laboratory work has been done that we have achieved a concept of the physiology of the kidney. Dr. Elwyn in his presentation of the normal function of the kidneys has very carefully evaluated the experimental observations, expounded their different theories and has so organized these miscellaneous observations as to render the reader's concept modern and logical. After discussing the normal function of the kidneys, renal insufficiency and the tests to determine the lessening of the variability of kidney function, the mechanism with which the organism attempts to overcome the insufficiency is detailed. The symptoms of poisoning which result when this insufficiency can no longer be compensated have been included under the term uremia.

In kidney disease one is interested in determining whether the function is normal or whether renal insufficiency exists. If renal insufficiency exists the degree is necessary—whether relative or absolute. This depends upon the type of disease existing—the part involved and the degree to which it has been damaged. To adequately discuss this phase, various classification of diseases of the kidney have been developed, so many in fact, that seldom one finds two writers using the same classification or the same term in the same manner. The author advocates and follows the classification developed by Volhard—a separation of the various forms of glomerulo-nephritis from tubular, from the

point of view of the function of the kidney and from the point of view of the clinical symptoms. Of each condition propounded a chapter is used to present the particular pathological anatomy, etiology and pathogenesis, symptomatology, diagnosis and treatment. Each chapter is supplemented with a rather complete bibliography.

The reviewer considers the work of Dr. Elwyn as an outgrowth of Professor Franz Volhard, but his observations and offerings have been complete and free. Experimental data forms the foundation for all his contentions and his conclusions have been carefully weighed. This monograph is a masterly review of the high points on nephritis.

INTERNATIONAL ABSTRACTS

Radium and Blood Cholestrol, C. E. Brunton, Quarterly J. of M., April, 1927.

Brunton estimated the total cholesterol content of the blood and plasma of thirteen patients suffering from cancer. The average concentration was 149 mg. per hundred cubic centimeters. In the oxalated plasmas of forty-four patients, the average concentration was 169 mg. per hundred cubic centimeters. After operations for nonmalignant conditions, after treatment for malignant disease by diathermy, and after its treatment by radon, the plasma cholesterol may either increase or decrease. In thirty patients examined before and after treatment by radon, no relation was found between the alteration in cholesterol concentration, and either the dose of radon or the time of its action within the limit of seventy-two hours.

A Comparative Study of Artificial and Natural Light, Orville Egbert, M. D., Southwestern Medicine, April, 1027.

Five groups of cases were studied in an effort to arrive at some comparitive conclusions of artifcially generated ultra violet light and sunlight. The patients in all groups studied were inmates of the same sanatorium, the same lamp and technique and the same solariums serving all.

1. The artificially generated ultra violet light produces a dry, blanched desquamating skin with apparently no circulatory changes, and produces little, if any, increase in pigment deposits. The tonicity and depth of the skin seems affected adversely. Freiberg's conclusions, that the ultra violet light fails to produce true pigmentation, corresponds with those of the author.

2. The air bath will produce what we style the pre-pigment changes of the skin. The skin becomes softer, oily, deep, and has a blush that shows increased capillary circulation. There is an increase in tonicity and slight increase in pigmentation. The term prepigment does not accurately describe what we are attempting to convey, for, in truth, there is some increase in pigmentation, but our observations are that these other skin changes are absolutely essential before sufficient light can be applied to rapidly increase the pigment. Skin, by intensive heliotherapy, can be pigmented without these other skin changes, but to the detriment of both the skin and the general health. Our conclusions are that the air bath is nothing more than a modified sun bath, nearly devoid of ultra violet rays. Therefore, when proper dosage of artificially generated ultra violet light is added to this modified sun bath we are administering the entire sun spectrum in a modified intensity. We believe that thise clinicians who feel that they are getting skin pigmentation from the quartz light alone are, in truth, getting it because their patients are receiving uncharted air baths. Lo Grasso emphasizes the necessity of providing sufficient air in the room in order to approximate open air conditions when the light is administered.

3. The most potent light energy is sunlight, and the sunlight most effective in therapy is that of the entire spectrum. Rollier states that intensity is as important as a sunlight rich in the ultra violet end of the spectrum. Therefore, the sunlight of highest therapeutic value is one rich in ultra violet rays and one of the greatest available intensity.

4. Those skins showing the most marked changes are cases receiving sunlight alone.

5. Sunlight of great intensity is too violent to be practical in low vitality cases.

6. In those cases able to secure marked skin changes, such as we record, the general physical changes are for improvement.

CONCLUSION AS TO TECHNIC

These conclusions have led us to formulate the following technic, which we have adhered to for the past six months with satisfactory results: We start the patient on daily air baths until we secure the skin reaction which we term pre-pigment. The patient is then placed on the combined air bath and quartz light radiations. We have found no patient unable to take these exposures, no doubt due to the fact that there is an absence of depleting heat rays. When the skin changes have progressed to the second degree and the patient is reacting favorably in a general way, the air bath is gradually replaced by the sun bath. As we progress with the sun baths, we gradually shorten the quartz lamp exposures until finally the patient has been built up to the full daily sun bath.

Effect of Ultraviolet Light on Oxygen Consumption and on Total Metabolism, E. H. Mason, M. D., and H. H. Mason, M. D., Archives of Internal Medicine, March, 1927.

Experiments were made by the Masons to determine whether the total metabolism of the human organism is affected by maximum exposures of ultra violet rays from a quartz mercury vapor lamp. Studies were conducted in ten cases. Eight of these patients manifested a notable lowering of heat production. This decrease in total metabolism has been associated with a slowing of the pulse rate. In no case was an increase of metabolism found. The subjects who reacted to exposures of ultra violet rays with a lowering of their total metabolism were normal persons in whom there was a satisfactory production of pigment, and persons who had an increased quantity of circulating bilirubin. Buckwheat, probably through the medium of phytoporpyrin, can produce a fall in total metabolism after exposure to ultra violet rays.

The Use of X Rays as an Acid in the Treatment of Pyorrhea Alveolaris, M. A. Lyons, Physical Therapeutics, May, 1927.

In several cases cited by the author, x rays have been of great value in the treatment of pyorrhea alveolaris. The spongy gums improved and the redness, soreness, bleeding, and pussy foul discharge cleared up. Only one failure in the series is noted. The x ray doses used are safe. The internal and external method is new. Sufficient time has elapsed to note the progress of these cases cited. Prompt treatment upon recognition of the disease influences the results. X ray treatment allows dental work to be done at a later date.

Effect of Excessive Radiation with Ultra violet Light on Growth of Rats, J. L. Leigh-Clare, Biochemical J., Vol. 21.

Observations that were made by Leigh-Clare showed that provided the eyes were shielded, exposure of young growing rats to ultra violet irradiation for periods up to thirty minutes daily was not found to have a deleterious effect on the growth and well being of the rats (although this dose was found to be fifteen times the adequate dose for male rats). It was also found that exposure for thirty minutes to the lamp had no more beneficial results than exposure for the shorter periods.

X Rays, Radium, Endothermy and Other Physical Agents in Dermatology. Joseph Jordan Eller, Physical Therapeutics, June, 1927.

Eller reviews the uses of these physical agents in the various types of skin affections and illustrates his cases with photographs . He summarizes his conclusions thus:

1. Numerous skin diseases have been found to be amenable to any one of several physical agents or their combinations.

2. In considering the relative value of the treatments, permanency of cure, cosmetic results, safety and comfort to the patients were considered.

3. The conclusions as to the relative value of the various treatments were drawn by the writer from close observations of over one hundred thousand physiotherapeutic treatments administered in clinic and private practice.

Observations on Fifty Skin Cancer and Other Chronic Skin Lesions Successfully Treated with X Ray, Geo. H. Carr, M. D., Virginia M. J., May, 1927.

Carr employs a technique which brings the radiation in the diseased area within fourteen days to 100 per cent of an erythema dose by treatment every third day; then he keeps it at this saturation point by subsequent fractional dosage for a period of at least three weeks. This rule may vary, however, as it is not applicable in all cases of skin cancer.

Some very large cornua of the nose, pigmented moles, several cases of keratosis senilis, psoriasis and other skin diseases, were cured by giving mild dosage of x ray at frequent, regular intervals. All radiation must be carefully measured and cumulative effects calculated; otherwise, there may be insufficient radiation, and treatment fail, or there may be an excessive effect and considerable damage follow.

Several case reports are given.

Activation of Foods by Ultra Violet Irradiations, without Injury to Taste. Ferd Rohr and O. K. Schultz. Klinische Wochenschrift, No. 2, 1927.

The authors have exposed food stuffs, particularly butter and cream, to ultra violet rays, and have thus succeeded in activating these foods. In the activation process the cholesterin content plays the chief role. In order that no injury occurs to the taste, the albumen must first be removed. The authors believe that they can obtain in this way an effective antirachitic butter fat preparation, with which, owing to its higher cholesterin content, wonderful results can be obtained. Further experimentation is in progress.

Presentation of a Case of Chronic Anterior Poliomyelitis (Progressive Muscular Atrophy) Treated Years Ago by Radio-Diathermotherapy. H. Bordier. Journal de Radiologie et D'Electrologie, XI, 4, 1927.

The patient, suffering from chronic anterior poliomyelitis, was first submitted to radio-diathermotherapy in November, 1911. He enjoys good health at the present time. This case has been reported in the author's book, "Diathermy and Diathermotherapy," Pp. 511 of the third edition.

When the patient was first seen in November, 1911, all the muscles of the hands, of the forearms, of the arms and shoulders, had undergone progressive atrophy. The atrophy, having begun in the hands, proceeded from below upwards. The last muscles attacked were the deltoids and the infra and supra spinatus. The atrophy had begun a year and a half before. There was a marked hypothermy of all the atrophied regions, particularly the hands. Radiotherapy was applied immediately. The irradiations were made obliquely, to the right and the left of the cervical cord, in a series of three sittings a month; there were thus six series. Diathermy was applied by means of a moistened spongy cylinder on all the atrophied parts from the hands to the shoulders. After fifteen sittings, heat was re-established in the hands and arms. This heat was maintained. The hands in particular remained warm even in winter. However, several treatments were given from time to time.

After the first series of radiotherapy, there was a noticeable improvement. First, the atrophic process was arrested; the muscular masses of the shoulder became manifestly larger. The circumferences of the deltoids increased several centimeters. Movements at the same time improved.

On the Treatment of Iris Tuberculosis with Roentgen Rays. H. Martensten and A. Richter. Klinische Monatsblatter fur Augenheilkunde, No. 78, May, 1927.

Roentgentherapy has been applied only in recent years in iris tuberculosis. (Scheerer in 1922 and 1925.) The fear of harmful effects is removed with careful dosage and filtering. The lens is especially resistant to the effects of roentgen irradiation. The authors treated with roentgen rays, forty cases, some with ancient, some with recent iris tuberculosis. The results were very favorable, especially in the recent cases. Among ten cases nine were successful, i.e. absence of excitability and clearness of the bulb. Twenty-four hours after irradiation an early reaction sets in, which in most cases disappears after the following twenty-four hours. The eye then begins to lose color, exudate formation ceases, precipitates disappear, and tubercles are resorbed. Older cases require higher combined doses than recent ones and the effect is not so certain. In five cases there were lens injuries, in two others corneal degenerations. All could not be brought into a single relation to the irradiation because old cases were dealt with. It is important to notice that after four to six weeks a late reaction sets in which may go along with injection and precipitate formation; further irradiation should not be applied in this case. A tuberculin cure should be instituted instead, since the roentgen rays have only a local effect.

Effect of Ultra Violet Rays on the Different Radiological Aspects of Rickets. A. Laquerriere and R. Lehmann. Journal de Radiologie et D'Electrologie, XI, 4, 1927.

Certain children have arched limbs; these children are in general pale, fat, puffed, lymphatic. The radiograph shows neither a fringe on the terminal surface of the diaphyseal extremity, nor enlargement of the extremity of that diaphysis; on palpation no hypertrophy of the region of the joint is found. The curvature in these cases seems to be attributable to a laxity of the ligaments and to a hypotonicity of the muscles. In general actinotherapy, in these cases causes the disappearance of the general puffed up condition; the child grows, recovers the total tonicity of his body and his limbs straighten. There is no question here, in the author's opinion, of a true rickets. The typical pictures of rickets are:

1. The fringe. This disappears, in general, very rapidly under the influence of ultra violet light.

2. The enlargement of the diaphyseal extremity. This enlargment is not, in itself, modified by the treatment. Only under the influence of ultra violt light the

extremity ceases to grow, whereas the rest of the bone develops. Also, at the end of a certain time, the relations of the different parts of the bone again become normal and the hypertrophy of the joint disappears. It is necessary for this that the bone has had time to develop, that is to say a considerable number of weeks.

In regard to the hypertrophy of the diaphyseal extremity, the authors remark that certain children have an apparent incurving of the diaphysis; the extremity is hypertrophied above and below, only on the internal side, or only on the external side. The result of this is that one of the surfaces of the bone is concave. On palpation and on inspection one also gets the impression that the diaphysis is arched. This incurving disappears little by little with the development of the bone as a whole.

3. Finally there exist true curvatures. On these curvatures the action of ultra violet is inconstant. It seems to the authors that the results are good, although slow, if treatment is begun immediately. On the contrary if treatment is begun late, not only are the results slow, but it also often happens that a complete cure is not obtained. Finally the statement is made that in those cases where there was very little fringe or none at all, no modification in the anatomical sense was obtained. They therefore conclude that in these cases there is no true rachitic malformation, but a sequel of a cured rickets.

Energy Measurements of Roentgen Rays. W. Rump. Zschr. F. Physik, No. 43, 1927.

A physical energy measurement is only possible when the combined irradiation is completely absorbed and transformed into heat. The author has constructed a calorimeter in which the roentgen rays enter through an opening in a hollow space, which is surrounded by thick leaden walls. The increase in temperature of the leaden coat is measured by the increase in volume of a contact fluid. The rays are generated with a pressure of 43-15 kv.; filtering amounts to about 2 mm. of copper. It is found that the total energy rises with the square of the pressure. The use effect was found at 150K. V. and anticathode at 1.6 per cent of the cathode ray energy; it is therefore considerably higher than that accepted until now. The energy necessary to give rise to a pair of ions in the air was found to be 33 volts for strongly filtered hard roentgen rays. It is probably, in the investigated field, from 0.43 to 0.12 Angstrom units, constant.

Galvano-Radiotherapy in Facial Paralysis. Bulletin Official de la Societe Francaise D'Electrotherapie et de Radiologie, March, 1927.

According to the observations of Constantin, of Toulouse, the author combines galvanization with radiotherapy. He employs the continuus current twice daily the first month (five minutes in the morning, five minutes in the evening, 5 to 10 ma., some interruptions at the end of the sessions after the third week) daily the second month (with a ten-minute duration). For three patients application of one auriculo-mastoid fossa to the other, for two, technique of Bourguignon. Three of the patients have been submitted to four sittings of radiotherapy: localizer 6-8½ behind ear; filter 3 mm., 250 R. each time, a session every eight days.

The five cases seemed similar clinically and from the point of view of electrical reactions. The patients who have not been submitted to electrotherapy have been cured more slowly. Those who have been slightly improved by the galvanic treatment alone, have been considerably improved after the addition of the x rays.

Diabetic Gangrene Cured by Diathermy. Deher mand De Brancas. Journal de Radiologie et D'Electrologie, XI, No. 1, 1927.

The patient, 77 years old, had an attack of pain in the right foot at the end of November, 1924 . She had been a diabetic for 25 years. At the time of examination patient suffered enormously; her foot was swollen; the third toe, completely black, was the seat at its superior extremity (phalango-metatarsal joint), of a sero-hemorrhagic oozing; on the external edge of the foot there was a small violet colored plaque; there was also a gangrenous plaque in the median part of the plantar surface, in the region of the forepart of the foot. The general condition was also bad, with a great quantity of sugar in the urine.

An energetic treatment with insulin was instituted, and the first application of diathermy was made December 24. At this time there was no pulsation of the tibial artery. Three weeks later the pulsation reappeared. The same treatment was continued; the toe dropped off about two months after the beginning of the treatment, and through the gap thus opened were eliminated the debris of the gangrenous tissue. The swelling reached the ankle. Antigangrenous serums were used as local dressings.

The sugar having virtually disappeared from the urine, the insulin dose was correspondingly decreased. Little by little the appearance of the foot changed. The painful crises finally disappeared, the gangrenous plaque which was at the external edge of the foot sloughed off without leaving any trace; the patient felt better and was allowed to go about on crutches.

At this time the improvement progressed rapidly, the ankle again took on its normal form, and the gangrenous plaque sloughed off, leaving an absolutely healthy skin. The foot, all white without edema, presented only one orifice about 1 cm. in diameter, through which some small debris still oozed. At this time the

patient was considered cured; she walked around on crutches and passed entire days on a chair on the porch.

Treatment had lasted six months; during this time the patient had a diathermy treatment almost every other day. Each sitting lasted 35 to 40 minutes with an intensity of 600 to 700 milliamperes. Very remarkable, according to the author, is the reappearance of the tibial pulsation, the entire absence of which had been established by the attending and consulting physician.

Action of the Sun on Potassium of Living Organisms. J. Risler and Foveau de Courmelles. Journal de Radiologie et D'Electrologie, XI, No. 4, 1927.

Potassium is found in living organisms, particularly in blood cells. The effect of potassium on organic functions is not due to its chemical properties, but to the radioactive properties of that metal. A smaller amount of radioactive energy than is necessary during winter, being sufficient during summer to maintain functional automatism of the hearts of lower animals, has caused the author to ascribe this to the action of the sun during summer. To determine whether its radioactive constant will be raised, the author exposed to the sun potassium chlorate placed on sensitive plates. From these experiments the first conclusion reached is that the sun has an unquestionable effect on the micro-radioactivity of potassium. On the 48th day two of the plates showed a definite impression. Another conclusion is that one of the principal effects of the sun, or of rays of greatest wave length on the living organism, can at last be determined in a very exact way. The sun, in effect, irradiates the element potassium which is found in the blood. The light of the sun increases the number of particles emitted by the element potassium; these particles call forth the ionization of neighboring atomic systems, changing their mass, lowering the heats of formation, and in one word, accelerating vital phenomena, thus raising the general state and increasing the consumption of oxygen.

Ocular Accidents of Actinotherapy and Their Prophylaxis. Toulant. Jouranl de Radiologie et D'Electrologie, Vol. XI, No. 4, April, 1927.

Ocular accidents in the course of actinotherapy are fortunately rare, thanks to the precautions which are taken. But the author has found a certain number of instances in his own personal researches, both clinical and experimental, which he has recently made on the action of ultra violet light in ophthalmology.

Infra red rays are responsible for cataracts; the visible rays, although they play no role in the lesions of the cornea and the crystaline lens, cause photo-traumatic lesions of the retina; the ultra violet rays are responsible for the greatest number of ocular accidents in industry and actinotherapy. They cause actinic keratitis.

In general actinotherapy it is necessary to protect the eyes against the ultra violet as well as the infra red rays. It is first of all necessary to interpose an opaque screen between the source of light and the eyes of the patient. It is best to protect the face by a thick black veil suspended vertically above the neck, The eyes are also protected against diffuse light by Fieuzal glasses No. 6-8.

In local actinotherapy the visible rays can be avoided by contracting the pupil through the instillation of pilocarpine. The infra red rays, which are the most dangerous, should be arrested as completely as possible by the interposition of a quartz vessel filled with a solution of copper acetate 5-100. If it is necessary to prolong the irradiations, it is well to manipulate the vessel in such a manner as to be able to obtain a circulation of water to prevent heating the solution.

Prophylaxis is very important in these accidents. The lamp should be masked by an absolutely opaque reflector. The physician should wear dark colored glasses furnished with opaque frames, preferably metal. Treatment for ocular accidents is given.

Electro-Radiotherapy in Diseases of the Prostate. W. Vignal. Le Journal Medical Francaise, XVI, No. 1, 1927.

Prostatitis: High frequency and high pressure currents have a vaso-motor and inhibitory effect on sensory nerves. High frequency currents are applied either monopolar or bipolar. The author prefers the latter method. A metallic electrode connected to the upper pole of the Oudin Resonator is introduced into the rectum. The other end of the resonator is connected to a plate placed on the abdomen close to the pubis.

After several sittings (five to seven), pain completely disappears. Diathermy acts by the endogenous heat it develops within the tissues, and calls forth an intensive vaso-dilation. High frequency currents, themselves, or through their derivative effects, act on micro-organisms, particularly gonococci. A Hegar bougie, No. 18, is introduced into the anus and connected to one of the extremities of a small solenoid, an abdominal plate being connected to the other. Daily sittings are held of fifteen to twenty minutes each, with 500 to 800 milliamperes. During the very first sessions painful symptoms disappear, the prostate clears up. In the subacute and chronic prostatitis roentgentherapy can be employed according to technique given below.

Hypertrophy of the prostate: Electrolysis of the prostate across the rectum gives no results. Galvanization was advised, but there were equally no results. High frequency under the form of pressure or diathermy acts only on congestive symptoms and the periprostatitis in the beginning. The best physiotherapy of prostatic hypertrophy is roentgentherapy. "X rays act as selective agents of cellular destruction."—(Regaud.)

The author reviews the various French and foreign papers which appeared on this question.

The road of choice seems to be the perineal, to which one may add, in certain cases the suprapubic road. The author treated his cases with a pressure of 150 kilovolts, an intensity of 3 ma., filtered by 7 mm. of aluminum. Doses, 600 to 800 R. or 3 to 4 units H. per weekly session. Position: knee chest. The ampulla is centered with a localizer of 10 cm. diameter, on the raphe between the anus and the root of the scrotum.

The immediate and remote results are considered. Curietherapy can equally be employed, but a difficulty in dosage arises.

Cancer of the prostate: Curietherapy permits the local, exact and direct application. In certain cases the action of radium can be supplemented by deep radiotherapy (200 kilovolts pressure). V. reviews the various methods of applying radium in cancer of the prostate. The method of inserting radium after total prostatectomy gives the best results.

Localizers for Local Actinotherapy. Pierre Porcher. Journal de Radologie et D'Electrologie, XI, No. 6, 1927.

Author presents a series of localizers of melted silica, which can be adapted to all the lamps in use, and which answer a very urgent need. A localizer must be a good conductor of ultra violet, a poor conductor of heat (the absorption of infra red reduced to a minimum), and should be easily adapted to all existing apparatus. Melted silica has the following advantakes: Its transparency in the visible spectrum is three times as great as the clearest glass (crystal); under a thickness of 1 meter the latter transmits only 35 per cent of incident light whereas melted silica under the same thickness transmits 92 per cent. The most transparent glass arrests all rays below 3000 Angstrom units (within ultra violet); silica has no noteworthy absorbability up to 2300 Angstrom units. As Joos has indicated, silica still manifests a transparency up to 1930 Angstrom units. All these properties find their application in the localizers for multiple reflection described by the author. If the extrmity (a) of a cylinder of silica is strongly irradiated by a source of ultra violet, there will follow a series of total reflections of the radiation in the interior of the cylinder, and the beam emerges through the extremity (b) of the cylinder regardless of the shape into which the cylindrical body had been cast. One thus possesses a means of conducting a beam of ultra violet into a place which is inaccessible to direct radiation. The quantity of ultra violet energy emerging through the largest localizer, despite the multiple reflection, is about 80 per cent. In order to arrest all of the infra red rays a small cube of silica with parallel surfaces and containing a slight thickness of water, is interposed between the base of the localizer and the source. This cube is placed behind an intermediary to which is attached a small wheel permitting a freedom of orienting the localizer and at the same time a certain gliding movement from before backward. The lamp which is fixed is thus rendered independent of the localizer, which is submitted to all possible movements of the patient.

Various forms of localizers are pictured. The vaginal localizer has a conical staircase shaped end and can be introduced into osteomyelitic cavities or into the rectum. Two are particularly suitable for fistulous tracts, and one cylinder of small diameter is especially adapted for the urethra or the external auditory canal. Finally a large localizer is designed for use in boils and anthrax.

Ultra Violet Light in Whooping Cough. Bru Camille. Journal de Radiologie et D'Electrologie, XI, 4, 1927.

The author had remarkable success with ultra violet light in whooping cough.

Technique: The method employed does not differ from other methods commonly used. The children were completely undressed, their heads covered and their eyes protected. The irradiation was aimed at the chest, the distance of the burner being 70 cm. The first session consisted of a two-minute irradiation on the anterior surface of the chest and a two-minute irradiation on the posterior surface. In the following sittings, held every two days, there was an increase of two to three minutes each time. If the erythema was very pronounced, the time of irradiation was reduced. Two lamps of the common type were used.

The results with this treatment were very satisfactory. Whenever the children presented from the beginning a pronounced erythema, they improved rapidly and were cured. The conclusions are based on statistics of 33 patients.

1. Disease was checked—3.
2. Partial success, corresponding to a definite and marked improvement—3.
3. Cures—27.

The proportion of checks is therefore about 10 per cent, that of improvements about 10 per cent, and that of cures about 80 per cent.

On the Increase of the Deep Diathermic Effect. Dr. Kurtzahn and Dr. Frey. Mitteilungen Aus Den Grenzgebieten Der Medizin und der Chirurgie, 40, No. 3, 1927.

Authors report on experiments in which they attempted to decrease the heating effect of the current on the skin and thus make possible the application of stronger currents for more intense deep effects. To lessen the effects of the diathermy current on the skin, the diathermy electrodes are cooled by means of cold water.

Cold water circulates between the metal electrodes and the skin (animal and cadaver experiments). Small glass cylinders 5 cm. high and 5 cm. in diameter, the ends of which are sealed by metal electrodes, are placed firmly on the skin by means of a frame-like apparatus.

The space between the electrodes and body surface is constantly filled with cold water and drained by a system of pipes. This arrangement, not proving practicable, was later replaced by sealed metal boxes in which cold water circulated and which at the same time served as electrodes. Higher deep temperatures were reached with corresponding lower surface temperatures. Experiments on patients have not yet been made and are not practicable before more results are obtained from animal experiments.

Histology of an Epithelioma Treated by Electro-Coagulation. Ch. Laurentier, Annales de Dermatologie et de Syphiligraphie, VI series,, Vol. VIII, No. 3, 1927.

Electrocoagulation is not indicated for the treatment of epitheliomas. This conclusion is reached from the histological findings of an epithelioma taken from a 75-year-old woman. The epitheliomatous mass is destroyed, but the roots of the neoplasm remain intact. The roots under the epidermis continue to grow and reach the outlying parts, which are outside the zone of action of the treatment.

Perichondritis of Auricle in Roentgen Picture. H. Richter, Zeitschrift f. Hals-, Nasen-, Chrenhlk, 17, No. 4, March 18, 1927.

The Roentgen picture shows distinctly changes in shape and size of the concha and cartilage as well as abscess formations and extension of destructive processes in the region of the cartilaginous framework of the auricle. Roentgen pictures and bibliography are included.

Technique: Patient sits on a revolving chair, face oblique to tube. The tube of the instrument is then brought to the ear so that the focal distance is about 40 cm. A diaphragm of about 5 cm. diameter is placed in front of the tube which is 15 cm. long and 12 cm. in diameter, and the central ray which is aimed at from the side and above is directed exactly on the porus acusticus. A light-proof sealed film of about 6.9 cm. is held behind the auricle. It is firmly set in the groove of insertion of the auricle. The pinna is thus pressed somewhat forward and lateral. Each auricle is taken separately. Exposure time ranges between 0.3 and 1.0 seconds, according to the thickness of the auricle, with a current of about 28-30 ma.

On the Use of the Wood Light in Dermatology. Herbert Fuhs, Dermatologische Zeitschrift, 50, No. 1, 1927.

The visible rays of a source of light are so completely muffled by a liquid filter, that the remaining, preponderating, short waved, fluorescence exciting waves (ultra violet with a wave length of 360 $\mu\mu$) can have an effect. The liquid filter consists of $CaSO_4$ and the deep dark orange dye, nitroso diethyl aniline. Light after being filtered in this manner is known in the literature as the Wood light. The fluorescence exciting property of the Wood light is accentuated and can be employed to detect skin changes. Thus, through the removal of the normal red component of the skin coloring in ordinary light, teliangiestasies and hemorrhages, as for example in Roentgen atrophic skin and rosacer, purpura, etc., can be recognized very distinctly as dark brown-black. A similar still more remarkable contrast effect in relation to the surrounding skin is found in pigmentations of various kinds as in chloasma pigment naevi, etc., which appear mostly as black spots. Especially remarkable is this contrast effect in hyperpigmented spots in pigmented skin (vitiligo, leukoderma) and in scarred, atrophic skin as for instance, Roentgen skin. In certain respects it is valuable as a diagnostic method as is shown by the fact that even slight pigment rests as a result of Roentgen, radium and even Ultra Violet irradiation are often recognized years later by the ultra violet dark light, as dark brown spots, even if the skin shows no signs of it in ordinary light. Fluorescence properties of disease transformed skin must be studied more thoroughly. The literature is cited.

Ultra Violet Irradiation of the Cornea. Dr. Wolfgang Hoffman, Klinische Monatsblatter fur Augenheilkunde, 78, April, 1927.

On the basis of material of 800 cases, the irradiation with ultra violet light in inflammatory diseases of the cornea, Ulcus Serpens and Rodens, Herpes Corneae and Episcleritis, is found to be very successful. To be sure, there are some failures, as there would be with any other treatment. The treatment in ulcus serpens consisted of two irradiations a day for six minutes; a large ulcer needs a greater amount of irradiation. These

dosages are applicable only if lamps similar to the author's are used. The arc lamp was used almost exclusively. The lamps were fed with an equal current (6-8 amp.) As a filter, Uviol glass was used (Zeiss) of 1.5 mm. strength, which transmits a part of the blue (from about 450 $\mu\mu$ and below), violet and ultra violet up to 180 $\mu\mu$. Its transmissibility for 290 $\mu\mu$ and below is definitely weakened. The irradiation distance was 30 cm. from the positive crater. Fluorescein in an alkali solution of the following composition was used as a sensitizer:

Fluorescein 2.0 Sod. bicarb. 4.0 Aqua dest. ad. 120.0.

For superficial tuberculous processes the mercury vapor lamp which is rich in ultra violet and poor in visible rays, is used.

Effect of Ultra Violet Rays on Sugar Regulating Apparatus of Children. Umberto Ferri, Rivista di Clinica, Pedratrica, 25, No. 4, April, 1927. Abstract-Fortschr. der Med. 45, No. 24, 1927.

Investigation of the blood sugar in children, after quartz lamp irradiation, yields the following results:

The blood sugar level in fasting children sinks after a short irradiation, and on the contrary rises after a longer irradiation. The alimentary glycaemia is variously influenced by the irradiation. The variation depends on the duration of the irradiation and on the special relation of the organism, primarily to its sugar regulating ability. In some cases, irradiation causes an increased activity of the sugar regulating apparatus and thereby causes a diminution in the glycaemic reaction after the ingestion of food; in other cases, especially with long lasting irradiation, there is on the contrary a disturbance of the sugar regulation and a rise in the blood sugar level. The changes in the blood sugar level under the effects of irradiation are immediate, and cannot be demonstrated after 48 hours.

Rickets Prophylaxis. Valerie Bruck-Biesok, C. Pirquet and Richard Wagner, Klinische Wochenschrift, No. 20, May 14, 1927.

The author comes to the conclusion that milk from cows which had been irradiated by the quartz lamp is suitable for rickets prophylaxis of children born at full term. The method has the advantage in that it can be used directly after milking without further manipulation.

Roentgen Therapy of Arthritis Gonorrhoica. G. Schulte, Munchener Med. Wschr., No. 17, April 29, 1927.

Satisfactory results were obtained from irradiation in gonorrheal joint inflammations. There was a complete freedom from pain and a complete mobility of the joints in a relatively short time. Although the previous therapy of several months' duration was without success, pain was almost completely gone a few days after the first irradiation. Movements could be executed without much pain after the second and third irradiation, and an intensive follow-up treatment of passive movements, hot baths and massage could be instituted. The x ray pictures, before and after the treatment, indicated the complete disappearance of the joint changes. Irradiations were not made in definite intervals. The previous irradiation was allowed to have an effect before the next irradiation was undertaken. There is no need of a complete homogeneous irradiation of the joints since in inflammatory diseases, good results are obtained with ordinary apparatus, aluminum filtering, and even with non-homogeneous irradiation.

Irradiation technique: Neo intensive reform apparatus with an equal pressure of about 210 K. V. Filter 1.0 Cu. plus 1.0 Al. Dose 10 to 15 per cent H E D. The joints are homogeneously irradiated from one or more fields, according to their thickness.

Healing of a Tuberculous Ulcer of the Mouth by High Frequency Current. Pedro de Cunha and Helion Povioa, Brasil Medico, No. 13, 1927. Abst-Fort, der Med., No. 23, 1927.

Eight months ago there appeared a very painful excessively secreting ulcer of the lower lip in a patient, a 36-year-old man, who gave a history of the triad of venereal diseases. The ulcer, despite all local treatment with caustics, grew in all directions in a very short time, so that at the time of the examination it was found to be on the inner mucous membrane of the mouth and the edges of the lips. The ulcer was of a pale color in contrast to the surrounding mucous membrane, and covered with a rather firm crust, the removal of which exposed a granular rather deep foundation which bled easily. The edges of the ulcer were undermined and surrounded by a wall of newly formed, extremely hyperemic tissue. Pain was felt on pressure and there was a slightly enlarged lymph gland of the neck. Differential diagnosis wavered between ulcus syphyliticum, tuberculosum, sporotrichoticum, or leishmani. The appearance of the ulcer as well as the strong positive Wasserman spoke in favor of ulcus syphiliticum. A strong antiluetic treatment, however, had no effect on the ulcer. Tests of the pus for tubercle bacilli, spirochetes, fungi, and leishmani were negative. Animal tests yielded no characteristic tuberculous changes of the tissues. Calcium Iod. and tartar emetic, without radiotherapy, were used with only transient success. The histological investigation of an exudated particle of the ulcer finally cleared up the matter in that it yielded definite proof of the tuberculous nature

of the ulcer. The author then succeeded in obtaining a remarkable improvement in only two weeks by the application of the high frequency current. The improvement continued, so that in less than a month the ulcer was entirely gone. Besides the high frequency current, no other therapy was applied, nor was the mode of life of the patient altered.

Physical Basis of Radium Therapy. Friedrich, Fortschritte Der Med., No. 20, May, 1027.

Constituents of radium emanation: Roentgen rays are exclusively electromagnetic waves. Radium rays contain also corpuscular rays: a and β rays. The a rays are the rays of the helium nucleus and the comet rays of Roentgen tubes. Their size lessens their penetrability and they also easily impinge upon atoms. β rays are corpuscular rays with a negative charge (Cathode rays). The velocity of some of the β rays is almost as great as the velocity of light. The γ rays of radium correspond to Roentgen rays, but possess a still greater wave length than the latter. During the generation of Roentgen rays in the gas containing Roentgen tubes, many a and β rays arise, in addition to the Roentgen rays. Among the radioactive substances there are those which emit a rays, others which emit only β rays, and still others which emit all three kinds of rays together: Uran IX, Thorium IC or Rad. C. Among the Roentgen rays the generation processes take place outside the atomic sphere, whereas with the radium rays, it is the nucleus of the disintegrating atom which emits the γ rays. Radium reparations are in a radioactive balance. Radium c has the greatest significance for medicine. To obtain the Alpha emitting radium emanation (radon), a radium mass of at least one gram radium is necessary. A β ray splits off from Mesothorium I, whereby Mesothorium II arises; by the splitting off of a β and γ ray from he latter Radio thorium arises; then through further splitting off each time of an a ray, arise Thorium J, Thorium emanation, Thorium A and Thorium B, and through the splitting off of a β and γ ray from the latter Thorium C is left, which through the loss of an a ray is transformed into the inert Thorium D. The β rays of Ra. C and Mes. C are mostly eliminated by filtering. Very little has been done in measuring β rays. It can be assumed that the biological effect of ionization is almost parallel with that of β rays. The ionization method is used in the measuring of the γ rays. Spectro analytical measurements which are applicable to Roentgen rays cannot be used for radium rays because of their short wave length, so that they no longer have any photographic effect for the representation of the spectrogram. The ionization chambers for radium must be very small. In order to generate Roentgen rays of the hardness of the γ rays of radium a pressure of one million volts is necessary. If the ionization chambers are used for Roentgen rays, there will be entirely different results, since the dose within the measuring apparatus itself varies in that the percentage of the surface in only a depth of 1 cm. is lowered to 22 per cent, and in a depth of 6 cm. to 1 per cent. Practically, the dose can be measured according to milligram element hours, but the form of the radium carrier which is of great significance is not taken into consideration. Here the iso dose curves are especially adapted to indicate how much radiation is yielded to the tissues in definite cm. portions, provided the disintegraion coefficient of the preparation is first determined. Distant irradiations have been made with larger available radium masses.

Physical Therapy. Dr. J. M. E. Prevost, L'Independance Medicale, Nos. 11, 12, 1927.

In a review article of physical therapy, the author considers the potentialities and limits of all the physical agents available for treatment of disease. He considers the indications for physical therapy and compares physical agents with chemical agents used in medicine. The goal of physical therapy is, above all, to regulate the various modes of vital activity, and to maintain at their best, the conditions of movement and dynamic equilibrium. The author concludes that:

1. Physical therapy is a method of treatment whose purpose is the quintessential increase of the normal stimulants and dynamic agents in order to make cellular exchange physiologically perfect.

2. Electricity, light and heat, which are the very causes of physiological life, should be used to straighten deviated vital biochemical movements. These three forms, combined and transformed, of which life is only the result, are the strongest factors placed at the disposal of the therapeutist faced with chronic disease which is, moreover, almost always refractory to medication.

3. Physical forces and natural agents are in direct relation with the organism by such perfect paths of communication as are afforded by the nervous sustem. Their action is always strengthening and beneficial. If electricity, heat and light are the causes of vital dynamics itself, water indispensible to osmosis, air, oxygen and nitrogen, which form arterial blood from venous blood, are also necessary to insure a cure,

4. The many advantages of physical therapy cannot be realized without multiple and perfected apparatus permitting the utilization of all physical agents, electricity, water, air, heat, light, movement, ozone, oxygen, etc., etc., adapting itself not only to diverse patients, but to the idiosyncrasies themselves.

5. The principal results which one has a right to expect from physical therapy are: Elimination of

wastes, organic residues and poisons; decongestion, drainage of blood, complete vital oxidation, trophic action and cellular balance, the biological correction of deviated chemical operations.

6. Not only sluggish metabolism and arthritis, but also diseases in which there is a great deal of pain are cured by physical therapy. It equilibrates the organic budget where it balances excesses or deficits. Nervous diseases, dystrophy under all forms are in its domain. Arthritics, neurasthenics, patients with stomach or abdominal diseases, the neuropaths and gynecological patients are its chief clients.

7. A very easy tolerance, a usual harmlessness, joined to very rare contra-indications and to a harmonic tonic-sedative action, assure the future of physical therapy, which is the most rational method of treating diseases of civilization.

Cancer of Radiologists. F. Bordier. Journal de Radiologie et D'Electrologie, XI, No. 4, 1927.

The remedy for cancer of radiologists is diathermocoagulation. The author has successfully treated twelve cases, but says very little of the technique, having described it in various other papers. Anaesthesia should always be practiced, local or regional, as well as general, as the case demands. The latter was necessary in two serious cases treated by the author.

In his first case, in which the author himself was the patient, after local anesthesia, the tumor was coagulated. The tumor measured 18 mm. in diameter and formed a projection of about 5 mm. above the cutaneous layer. Ten days after the operation the scab sloughed off, and after five weeks the patient was cured. This was in 1921. The author warns against treating radiodermitis lesions with radium and thus superimposing on them radium dermitis lesions.

Tumor of the Pancreas and the Stomach Treated by Radiotherapy and Diathermy. Miramond de Laroquette. Journal de Radiologie et D'Electrologie, XI, No. 4, 1927.

A tumor of the pancreas and the stomach was treated successively by radiotherapy and by diathermy. The cure is apparently perfect and has been maintained for over a year. The patient, a woman of 68 years, was found to have upon operation a tumor involving the stomach and pancreas with disseminated roots, the total removal of which appeared impossible. The diagnosis of a neoplasm was clinically evident.

Radiotherapy was begun February 12, 1925. Twelve sessions were held during six weeks. Coolidge tube used. Sparks 34-40 cm., distance 35 cm., filter 5 mm. of aluminum, 1200 R. to the skin at each sitting, about 700 R. reaching the tumor and about 40-50 R. absorbed by a cubic centimeter. Toward the 15th of April an appreciable improvement begins, but pain persists, as well as gastric intolerance.

Diathermy was tried as a supplementary treatment principally to relieve pain. Twenty-five treatments are given from the 15th of May to the 15th of July, 1925. Large abdominal and dorsal electrodes above and below the left hypochondrium. Intensity, 1500 milliamperes, thirty minutes. At the end of May there was a notable improvement. Alimentation became easier, pain diminished and the weight increased. Eight months after the beginning of the physiotherapy treatment, the patient was entirely cured.

The author believes that diathermy should play an important supplementary role in the treatment of many neoplasms.

Infantile Paralysis Treated by X Ray and Diathermotherapy. H. Bordier. Journal de Radiologie et D'Electrologie, XI, 4, 1927.

Several infantils paralysis cases treated with a combination of x ray and diathermotherapy are presented:

The first case was five months old when first treated with x ray therapy and diathermy. Active movement gradually came back. She is now three years old with not a trace of paralysis. The other cases presented are a repetition of the successful treatment of the first. The cure was perfect in many cases, leaving nothing to be desired.

The treatment consists in having the region of the spinal cord, which carries the action of the polimyelitic virus, absorb a dose of x rays, measured under a filter of 6 mm. of aluminum; about 600 units R. in a series. The region to be irradiated is, for the upper limbs, included between the third and sixth cervical, and for the lower limbs, between the eleventh dorsal and first lumbar.

The Infantile Paralysis Cases Treated at the Herold Hospital (Paris), 1925-1926. Laquerriere and Lehmann. Journal de Radiologie et D'Electrologie, XI, 4, 1927.

Four cass of infantile paralysis are reported:

1. The first case, a child of 8 years who became paralyzed at 18 months, was treated by diathermy. Forty-three treatments were given from January to June. There was a manifest improvement: improved locomotion, disappearance of cyanosis and edema, condition of coldness remained, improvement in faradic excitability.

2. The second case was a young girl, 15½ years old, who became paralyzed at the age of 6 months. She received thirty-three diathermy treatments. There was a very great improvement of the trophic disturb-

ances. She could walk without the aid of apparatus, although locomotion was imperfect. During September and October 15 sessions of the constant and continuous current. No new improvement. With radiotherapy during October and November there was a manifest improvement of locomotion, although electrical reactions remained the same. In 1926 diathermy was resumed. Some improvement.

3. The third case was a child of 21 months. September, October, November, three series of three sessions each of radiotherapy. September to March, 80 sessions of continuous current. Progressive improvement.

4. Child 20 months old. August to October, three series of three sessions each of medium radiotherapy. August to December, 25 sessions of continuous current. (Diathermy was very badly tolerated.) Treatment by continuous current was continued as well as ten treatments by ultra violet to improve the general condition.

In conclusion: Two cases of ancient paralysis, with trophic disturbances, are presented, in which new methods, particularly diathermy, have had unquestionable results.

Effect of Diathermy on the Elasticity of the Vascular Walls. A. Dumas and A. Chevallier. Journal de Radiologie et D'Electrologie, Vol. XI, No. 1, 1927.

It is well known that good effects are obtained with diathermy in intermittent claudication, a condition in which there is more of a spasm than hypertrophied and thrombosed arteries. According to Lian (Lian and Descourt, "Good Effects of Diathermy in Intermittent Claudication," Presse Medicale, Oct. 22, 1924), diathermy acts particularly in those cases where the oscillations, observed by Panchon's apparatus, are only diminished. Its effect is very doubtful when the oscillations are abolished.

To ascertain the effects of diathermy in such cases the authors have experimented with a number of normal subjects. After they had placed one of the metallic plates, which were connected to the poles of the diathermy apparatus, on the anterior part of a thigh, and the other plate on the posterior part, the oscillometric curve was determined by Panchon's apparatus, the sleeve being applied around the corresponding limb. Then the circuit was closed and a high frequency current was allowed to pass for about fifteen minutes, the intensity of the current was about 700 to 800 milliamperes. At the end of this time a new determination of the oscillometric curve was made. Among all the normal subjects a distinct increase in the amplitude of the oscillations was established, with a tendency toward a lowering of the maximum. These effects are analagous to those of the warm bath which have been studied by Babinspy, Heitz and Froment. The question arises whether in these exact experimental conditions it is possible to invoke the explanation given by M. Bordier on the subject of the pascular action of general diathermy. In the author's case there was no elevation of the central temperature of the individual, and the hypothesis of a resistance to increased temperature is not plausible. It is possible that there is a local action on the sympathetic nerves of the portion of the limb submitted to the current, and a local rise in temperature may be the response to the action. The good effects reported by Prof. Cluzet in certain gangrenes of an arterial origin, notably in diabetic gangrene, are no doubt due to this mechanism.

The Effective Dosage in the Quartz Light Treatment of Erysipelas. J. Becker, M. m. W., 12, 1927.

The author had remarpable success with a few quartz light irradiations in the treatment of erysipelas. He applies 1½ erythema doses. With a good lamp this should require an irradiation time of 9 to 12 minutes, at a distance of 100 cm. Immediately after the irradiation the temperature drops and the progress of the disease is arrested.

Experimental Investigations on the Effect of Short Waved Ultra Red on the Skin. W. Jadassohn. Arch. f. Derm., 152, 1, 1926.

Wave lengths of a maximum of 1,400 were used; for this purpose correspondingly filtered carbon arc light is well adapted. The effect is stronger with a larger irradiation field than with a smaller, apparently due to the inferior cooling by the circulating blood. With a short irradiation, an erythema arises which is considerably greater than the irradiated surface (8 sq. cm), and has indistinct boundaries. At the end of an hour, a sharply outlined red spot of the exact size of the irradiated surface is seen. This gradually disappears in three to five hours. With a stronger irradiation, an erythema likewise arises directly, in the center of which, however, a swelling of the size of the irradiated field quickly forms. Within an hour the swelling changes to a blister and the redness disappears. A sharply circumscribed ulcer is formed, the surrounding edges of which become gradually inflamed, and its epitheliazation does not take place until after one to two months. The blisters are hyposensitive and the entire reaction is not painful. The reaction also takes place gradually in the deeper layers.

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